ARCHIVES OF OPHTHALMOLOGY.

SOME PRACTICAL POINTS IN EYE-WORK.[1]

ARGYROL—COPPER SULPHATE—PUPILS—PUPILLARY DISTANCE —ANGLE OF CONVERGENCE—OPHTHALMOSCOPY— EXAMINATION OF CORNEA—SCOTOMATOMETRY.

BY ALEXANDER DUANE, M.D., NEW YORK.

PROBABLY most, if not all, of the methods here given are well known to many practitioners. Yet there are some that doubtless do not know them, and it has seemed worth while to publish them all in the hope that, as their usefulness has been proved over and over again in my office, they may be equally serviceable to such others as have not tried them.

APPLICATION OF ARGYROL.

Argyrol dropped into the eye often produces the feeling as if a foreign body were present. We generally then find in the eye a floating mass of pus or muco-pus apparently more or less solidified by the action of the argyrol and mixed with the latter. This may occur even when the eye has already been pretty thoroughly flushed out. What happens in this case, I believe, is that the preliminary cleansing has removed all the secretion on the surface, but has failed to reach the secretion concealed in the folds of the conjunctiva. This concealed secretion the argyrol, owing to its density and penetrative

[1] Read at meeting of the Section on Ophthalmology, N. Y. Acad. Med., April 19, 1915.

power, reaches and expels—floating it out into the conjunctival sac. This penetrative and expulsive effect of argyrol—a purely mechanical effect, of course—constitutes, I think, one of the most valuable features of its action.

Because argyrol acts in this way I usually apply it as follows. I first flush out the eye with an indifferent solution (boric acid, normal salt), thus removing the superficial secretion and the contained bacteria; next drop in the argyrol, thus bringing the concealed secretion to the surface; then after waiting a few minutes flush out the eye again freely, thus removing the coagulated deep secretion and the argyrol; and finally instill another drop of argyrol, which is allowed to remain. In this way the secretions and bacteria are more thoroughly removed, and the argyrol that is last put in has unobstructed access to the germs that remain.

In prescribing argyrol for home use, I direct the patient to employ a similar routine of double irrigation and double instillation.

One of the chief uses of argyrol in conjunctival affections is to promote drainage. By sheer weight it passes down through the tear duct, and carries off with it the bacteria that would otherwise remain and multiply in the conjunctival sac. It also clears out the nasal passages themselves. Hence I always count it an advantage when the argyrol that we have dropped into the conjunctival sac passes freely into the nose or throat.

To judge whether this is the case or not, I get the patient to blow his nose some ten minutes after the instillation of argyrol, and note how deeply, if at all, the handkerchief is tinged. I also tell the patient to make the same experiment when using the argyrol at home. He may report that at first there was no staining at all, but that after a few days of treatment the argyrol began to come through profusely. This to me is a sign that the case is on the mend.

In order to facilitate the descent of the argyrol, particularly when there is a slight obstruction of the tear passages, I often, before instilling it, put in a drop of adrenaline. This by shrinking the swollen mucous membrane of the tear passages opens the way for the argyrol and enables it to get through when otherwise it could not. This simple treatment, repeated two or three times daily and combined with an occasional syringing

of the duct, will often relieve cases of fairly well-marked lacrimal obstruction without our being obliged to have recourse to slitting of the canaliculus or other operative procedure.

PRINCE'S COPPER-SULPHATE TREATMENT.

Because they are not as well known as they should be, it seems well to call attention again to the merits of Prince's copper-sulphate treatment of trachoma and allied conditions. It is applied as follows.

A ten-per-cent solution of copper sulphate in glycerin is used as a mother liquor. From this the patient is directed to make an aqueous solution daily by adding one drop of the mother liquor to nineteen drops of water. This 1:200 copper-sulphate solution is instilled into the eye three, four, or even six times a day. If it causes too much reaction, it is further diluted. On the other hand, as the eye gets accustomed to it, the solution is made more and more concentrated. I have never used a solution containing more than 1:150 of the sulphate. Prince, however, states that some of his patients used a solution of 1:50 or even stronger.

The aqueous solution does not seem to keep well, and hence should be made up fresh every day.

This treatment was first devised by Prince of Springfield, Illinois, who found it to work well in trachoma and its complications (corneal ulcers and pannus). He also used the undiluted ten-per-cent. glycerin solution as an application after expression in trachoma. The diluted glycerin solution in my hands has given excellent results in non-trachomatous follicular conditions.

MEASUREMENT OF THE PUPIL.

We measure the width of the pupil by applying the principle of Priestley Smith's keratometer. A millimeter scale placed in contact with a + 2.75 D. lens is held in front of the pupil, and the number of millimeters that the latter subtends, when seen through the glass, is read off by the observer who should be stationed not far from the focal point of the lens (36*cm*

in front of the latter). A very accurate measurement will thus be obtained, even when the scale is not held very close to the pupil.

REACTION OF PUPIL.

In determining the light reaction of the pupil, particularly when this is either naturally feeble, or has been artificially reduced (by homatropine, etc.), we use the method described by Uhthoff.[1]

The examination is made in the dark room. The patient covers one eye and looks with the other straight at the light. The observer standing a little to one side focuses the light with a strong lens precisely on the cornea, and through another lens watches the play of the pupil as the light is thrown onto the cornea and as it is withdrawn. Under these conditions there can be no convergence reaction on account of the exclusion of the other eye, nor an accommodation reaction, for the eye sees nothing on which it can accommodate, being aware simply of a diffuse blaze of light. On the other hand, the conditions are most favorable for the development of the light reaction, for, as the patient is looking straight at the light, the most sensitive portion of the retina (the macula) is suddenly subjected to a strong light stimulus, which is as suddenly withdrawn.

To fulfill the conditions of the test it must be remembered that the eye not under observation should be completely excluded from the light and the other eye should look straight at the latter.

MEASUREMENT OF INTERPUPILLARY DISTANCE.

The following method of measuring the interpupillary distance described by the German ophthalmologists is entirely satisfactory:

Observer and patient face each other. The observer's right eye and the patient's left eye are closed or covered. The two uncovered eyes (patient's right, observer's left) look straight at each other. The observer holds a millimeter scale between himself and the patient, with its zero mark in line

[1] Graefe-Saemisch, *Handb. d. ges. Augenheilk.*

with the center of the patient's right pupil. Then without moving the scale he directs the patient to open his left eye and close his right, while he himself opens his own right eye and closes his left. The patient being now directed to look straight into the observer's right eye, the observer notes what part of the scale is opposite the center of the patient's left pupil. The reading will give the interpupillary distance in *mm* when the visual axes are parallel. It therefore also gives the distance between the centres of rotation of the two eyes. This reading will be unaffected by the presence of a squint provided there is no absolute inability on the part of either eye to perform fixation.

MEASUREMENT OF THE ANGLE OF CONVERGENCE.[1]

The angle C which the two visual axes make when converging on any comparatively near object can readily be determined as follows:

Put on the patient a spectacle frame in such a way that it shall be 11.5*mm* in front of the cornea when the patient is looking straight forward. Measure the distance from the plane of this frame (*i. e.* from the point where it crosses the nose) to the object on which the eyes are converging. This distance in *mm* plus 25 will be (B) the distance of the object from the base line connecting the centers of rotation of the two eyes. Measure the interpupillary distance (A). Then

$$C=\frac{A\times 50}{B}+3$$

C being expressed in degrees of arc, and A and B in *mm*.

Thus, suppose the distance of the object from the spectacle frame is 65*mm*. Then A = 65 + 25 = 90. If now B is 60*mm*, then

$$C=\frac{60\times 50}{90}+3=36^\circ$$

This relation will hold good for all values of A between 50 and 400*mm* (2 or 16 inches). For points within and without these limits—which latter, however, include practically all cases for which the rule would be applied—the value of C is from 1° to 3° less than given by the formula.

[1] Described in ARCH. OF OPHTH., xliii., 5 (1914).

OPHTHALMOSCOPY WITH THE REFRACTION CORRECTED.

When the patient has a moderate amount of astigmatism—and still more, of course, when he has a good deal—it is surprising to find how the ophthalmoscopic picture gains in clearness and definition if the examination is made with the patient's correcting glasses on. In using the indirect method, of course, we can and should reduce astigmatic deviation to a minimum by placing our object glass in the proper position (*i. e.*, at a distance from the eye equal to the focal length of the glass plus 13*mm*). But even with the indirect method, the correction of the patient's astigmatism helps materially, and when we use the direct method the gain is very considerable indeed. It is quite astonishing to see how the details of the disk come out and how distinctly both vertical and horizontal vessels are simultaneously seen, when an astigmatism of even 5 or 6 D. is thus corrected. With a little adroitness the troublesome reflex from the surface of the glass is avoided and the examination made as easily as with the naked eye.

This method is useful not only in high astigmatism, but also in high myopia or hyperopia. The details of the fundus in a patient with 12 D. of myopia are better seen if the correcting glass is set in a spectacle frame on his face than if a corresponding lens is used in the ophthalmoscope itself. This is so because the ophthalmoscope cannot be held at a fixed distance from the patient's eye, and each slight to and fro shift of the instrument, as it carries the correcting glass nearer or farther from the eye, practically makes it a stronger or weaker lens, so that it no longer corrects properly the patient's refractive error.

EXAMINATION OF THE CORNEAL SURFACE.

The examination of the corneal surface by daylight often affords information better than can be obtained by oblique illumination. This is particularly the case when we are dealing with erosions, pittings, or irregularities of the corneal surface or with minute foreign bodies.

The best view of the corneal surface, I think, can be obtained as follows: The patient sits in a reclining or operating chair facing a window, with his head well supported and

thrown somewhat back. The surgeon, standing behind him, examines the cornea with a strong loupe, at the same time playing light from the window on the surface of the cornea with a lens of about three inches focal length. By making slight shifting movements of loupe and illuminating lens, and making the patient move his eye bit by bit in different directions, and by carefully observing the change of shape of the reflex image of the window or circular image formed by the lens as the eye moves, we get an idea of the smoothness and regularity of the different portions of the corneal surface, and information as to the presence of any marked irregular astigmatism. We also determine the presence of any pittings or other sharp irregularities in the corneal surface, and by using fluorescein can tell whether there is the slightest defect in the epithelium.

Finally we can detect minute or faintly marked foreign bodies (rust remnants, etc.). (These are particularly well outlined by fluorescein which forms a halo of green about them.)

MAPPING OF SCOTOMATA.

We all have experienced difficulty in mapping scotomata—especially central scotomata and also enlargements of the blind spots—owing to the inability of the patient to maintain fixation. This difficulty may in a measure be obviated by one of the two following expedients, which I have found serviceable.

Double-Object Test for Scotomata.—Suppose that we are mapping out a scotoma or the blind spot on the tangent curtain, at 30 or at 60 inches, and have fixed in approximate fashion three or four points in the circumference of the blind area. We now take two objects, for instance two white hat pins, and placing them outside the blind area bring them together until both disappear. Then by separating the two objects, so as to carry first one then the other out of the blind area, we shall soon discover where they shall be so situated as to be both just simultaneously visible; *i. e.*, so situated as to occupy respectively the opposite ends of a diameter of the scotoma. By repeating this operation in several diameters we shall determine at least the size of the scotoma, if we do not determine its absolute position and shape.

An extension of the method enables us to determine the latter with reasonable accuracy. Having determined, say the horizontal diameter, we stick white pins in the extremities of the latter. We then determine the vertical diameter, making sure that as we do so the patient is aware of the simultaneous presence of both pins on the horizontal diameter. We now stick pins at either extremity of the vertical diameter. All four pins should now be visible simultaneously, and the slightest movement of the eye should extinguish one of them.

Two or more oblique diameters may then be filled in in a similar way and marked by pins at either end. Then the entire congeries of pins will outline the scotoma with quite reasonable accuracy.

Complementary-Color Test for Scotomata.—The following procedure enables us to plot a scotoma in one eye and at the same time keep that eye steady by utilizing the good central vision and good fixation of its fellow. Its use is mainly restricted to central scotomata.

The patient is placed opposite the tangent curtain or any dead black surface. The good eye, covered with a dark green glass, gazes fixedly at the white central pin of the curtain. The eye with the scotoma is left uncovered. A small deep red (cardinal red) disk placed on the end of a black rod is carried along the curtain from the periphery of the latter toward its center, along each meridian in succession. The red disk will be nearly or quite invisible to the good eye, because when seen through the green glass it will appear a dark brown—almost as dark as the curtain on which it moves. It will be visible to the other eye until it reaches the limits of the scotoma, when it will suddenly disappear.

What actually happens in applying the test is this. The patient, looking with both eyes, sees on the curtain a greenish pin, on which he fixes, and a moving red spot, which approaches the pin. Suddenly—as the disk enters the scotoma—the red spot turns to a very dull brown or becomes actually invisible. In either case, the change is very striking, so as to be readily noticed even by the unintelligent or unobservant. I have applied the test with success in a child with strabismic amblyopia, due to a small central scotoma, the presence of which I was not able to demonstrate by other methods.

The test can be even better made with a ruby glass and an emerald green test-object; and it can also be made with an amber glass and a dark spectral blue test-object.

In any case the limits of the scotoma are marked out in the usual way by pins stuck in the curtain.

FIBRO-ADENOMA OF THE CILIARY BODY.

By A. J. BRUECKEN M.D., Pittsburgh, Pa.

(From the Pathological Laboratories, University of Pittsburgh.)

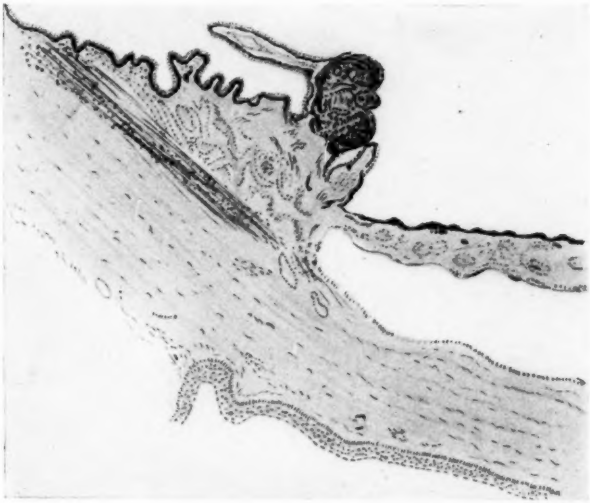
(*With one illustration on Text-Plate XIV.*)

DURING the routine microscopical examination of pathological specimens for diagnosis, a small tumor-like mass was found in the ciliary body of an eye which in the gross showed no evidence of its presence. The eye had been removed from a man of 63 years. The microscopic picture of the eye confirmed the macroscopic observations, save that the small new growth could not be detected by the naked eye. The materials were referred to me by Dr. Klotz for further study.

The history of the case was as follows: The patient worked all his life in a steel mill, and occasionally had pieces of flying steel get into his eyes. These were removed and he noticed no after-results. There was no history of conjunctivitis except at the time the foreign bodies were present. Six years ago the patient noticed a small white enlargement of the skin at the inner canthus of the left eye. This increased rapidly in size. After several months the mass was burned away by a physician. Three months later the inner canthus became inflamed and progressively worse. About eight months ago he had another operation performed, but the incision did not heal. Then he developed a sloughing cavity on the left side of the nose, apparently involving the eye. The eye was removed by enucleation. No tissue from this growth was received in the laboratory.

The eyeball externally was of normal size and appearance, but quite flaccid. The cornea and iris showed no change. The pupil was contracted and measured *2mm* in diameter. After prolonged fixation in ten per cent. formalin the globe was opened. The chambers and their contents

ILLUSTRATING DR. BRUECKEN'S ARTICLE ON "FIBRO-ADENOMA OF THE CILIARY BODY."



Fibro-Adenoma of Ciliary Body.

appeared normal. The crystalline lens was in situ, but fell away on the slightest manipulation of the eyeball. It measured 1*cm* in diameter and 0.4*cm* in thickness. Its consistency was very firm and on section the central portion was very hard. The iris, retina, choroid, and sclera showed nothing of special note and the ciliary body was well developed. No evidence of a nodule was seen in the ciliary body.

Microscopically there was seen in the anterior portion of the ciliary body, situated in the apical part of the ciliary process, a small irregular round or oval tumor mass, not over 0.75*mm* in diameter, staining purplish with hæmatoxylin-eosin. There was a remote resemblance to an intracanalicular fibro-adenoma of the breast, but aside from this it appeared quite unique. The ciliary plications were well marked, though there was no evidence on cross-section of the so-called "gland lumina," the recesses between the ciliary folds within the inner fibrous layer of the ciliary body and running in an equatorial direction.

The tumor mass occupied a position in the ciliary body directly opposite the equator of the lens and only one large ciliary elevation or fold intervened between it and the root of the iris. Unlike the tumor-like masses described by Alt, this mass was embedded in the surface of the fibrous layer of the ciliary body, forming a very low projection into the interior of the eyeball. Here on its inner surface it presented an appearance of having been deprived of the covering of the pars ciliaris retinæ, and, as indicated above, it apparently bounded the canal of Petit externally. However, it showed along this surface a definite layer of epithelial cells which in the anterior part were intact, but in the posterior part were somewhat broken. This covering represented the inner unpigmented cells of the pars ciliaris retinæ, which elsewhere was well defined into its two layers, but had an abrupt ending of the outer pigmented epithelial layer at both ends of the tumor mass. It is possible that the projecting portion of the tumor was broken away, and what was taken for the unpigmented cell layer of the pars ciliaris retinæ may have been one of the many epithelial cell layers present in the tumor. This was supported by the fact that those pigment cells on its surface at the anterior end were isolated, ill-defined, and had their pigment dispersed. The inner fibrous layer of the ciliary body was of

apparently normal thickness, but the ciliary muscle fibers were abundant and the circular fibers of Müller were well represented. The connective tissue in some of the plications, like that of the tumor, stained quite deeply and appeared dense and hyaline in character. Elsewhere the connective tissue of the plications was finely fibrillated and showed relatively large and thin-walled blood-vessels. There was no change in the neighborhood of the tumor mass where, it may be noted, the blood-vessels were fairly numerous. About the circulus major, which was represented by two vessels, one behind the other, there was a large number of mononuclear leucocytes. Numerous lamellar and pigmented connective-tissue cells were present throughout, but were particularly abundant in the anterior portion of the ciliary body.

The tumor mass itself consisted of a sharply defined body made up of aggregations of epithelial cells embedded in an abundant homogeneous, vacuolated, and quite acellular substance which stained uniformly pale blue with hæmatoxylin-eosin and in all respects resembled the denser connective tissue noted in some of the ciliary folds. With higher power one could make out a fine fibrillation of this substance which was similar to the tissue of the ciliary folds. This substance, therefore, which represented a type of connective tissue, constituted by far the greater part of the mass.

Alt described four tumors which were similar to the above case. He refers to the stroma as a "coagulated amorphous substance" and found some compressed and flattened cells in the tumor appearing like spindles of connective tissue or myxomatous cells. It was difficult in some instances to differentiate the connective-tissue nuclei from the epithelial-cell nuclei. The connective-tissue cell nuclei were either very irregular or elongated and of large size, but not as large as those of the epithelial cells. Sometimes the connective-tissue cell nuclei were distinctly nodular in appearance; nevertheless, all these forms were also noted in the connective tissue of the ciliary body generally.

With van Gieson's stain the stroma was less conspicuous on account of the brownish color of the epithelial protoplasm which was found to occupy a larger portion of the tumor mass than was supposed. Thorough search for blood-vessels in the

stroma showed their entire absence, although there were a fair number in the surrounding tissue. The epithelial cells showed large deep blue-staining oval, round, or polygonal nuclei with very poorly defined cell bodies. The protoplasm was of a clear homogeneous nature and showed no evidence of pigment granules except the marginal cells of the tumor mass. The latter formed a single almost continuous flattened epithelial layer on the inner surface of the rounded cup-shaped impression of the fibrous layer of the ciliary body in which the tumor resided, and it was this layer which so clearly demarcated the mass from the latter. At one place, however, this was not so, and here there was seen an inward extension of connective tissue from the fibrous layer of the ciliary body, which appeared to represent a plication with the usual covering, as is seen on the inner aspect of the ciliary body and a direct continuity between it and the connective-tissue stroma of the mass. Under low power, on account of this sharply defined limiting pigmented cell membrane, the appearance was not unlike an invagination and proliferation of the unpigmented cells of the pars ciliaris retinæ. The surrounding ciliary connective tissue immediately adjoining the tumor growth showed no change or relation to the tumor mass other than that mentioned. The protoplasm of the epithelial cells in the new formation seemed to merge insensibly into the surrounding tumor stroma even when stained by van Gieson's, in which it differed from the epithelium of the ciliary body. The arrangement of the epithelial cells was quite diverse: only a few formed tubules, while most were arranged in single or double layers which did not appear like glandular structures. The cells were often distorted, and the general haphazard disposition of all of the epithelial elements indicated a rather passive nature on their part, with no evidence of a proliferative response. Nevertheless, there was in most instances a more or less well defined contour and continuity of the epithelial cells, and in view of the receding character of the new formation with the excess of fibrous tissue there seemed to be little doubt that the tumor mass represented an epithelial inclusion with but little growth of the epithelial elements. The process may represent a primarily loosened and folded membrane of the pars ciliaris retinæ as Alt suggested, but in the present state the mass

mainly consists of a fibrous-tissue increase. However, it is also possible that the fibrous-tissue increase of the folds was primary and the inclusion of the epithelial cells in the mass of hyaline connective tissue was only an associated condition.

In the absence of definite landmarks, such as gland lumina and cell membranes, one could not determine the exact position of the nucleus within each cell, but at the margins of the mass the nuclei appeared to be placed centrally. The nuclei, although they stained deeply, were not pyknotic and mitotic figures were not observed.

A section through the nodule at a different level showed the stroma more deeply stained with a well-marked reticulated structure, while the epithelial cells were decidedly darker. In this section, which showed several indentations in the margin resembling infoldings of the epithelium, there was also an abundance of stroma. The indentations in the margins may represent spaces between the adjoining infolding membrane of the pars ciliaris retinæ, as already suggested. The peculiar nature of the connective tissue of the fibrous layer of the ciliary body, as observed by Dr. Klotz, not only in this case but in inflammatory conditions such as glaucoma, is noteworthy. Notwithstanding the fact that the fibrous layer of the ciliary body is normally quite thick, there appears to be, in these instances, a definite increase and hyaline transformation of the stroma.

In his article on "Intraocular Epithelial New-Formations," Alt considers several possible explanations for such tumor masses, namely: hyperplasia of the palisade cells of the pars ciliaris retinæ, analogous to hyperplasia of cells in the pigment epithelium of the iris, ciliary body, and choroid; their relation to carcinoma, described by previous writers; their possible inflammatory character; their relation to Treacher Collins's so-called "glands of the ciliary body"; and, as above mentioned, the possibility of the development of the process in the loosened and folded membrane of the pars ciliaris retinæ. He speaks of hyperplasia of the pigmented cells of the pars ciliaris retinæ during plastic cystitis as follows: "The whole layer appears very much thickened and grows into the cyclitic membrane in an irregular way. We, however, also observe frequently a more typical kind of proliferation of the cells of

the uveal layer in the shape of cylindrical tubes which grow into the cyclitic membrane and give off branches. In longitudinal and transverse sections these tubes appear like the glandulæ tubulosæ or the epithelial cylinders of an epithelioma. The cells of these tubes are either free of pigment or pigmented. Their shape and arrangement with their branches have given some authors (Schiess-Gemuseus) the idea that they are blood-vessels whose walls are filled with pigment."

As can be seen from the description of our tumor mass none of the above would appear to apply to it, for it showed no association with a cyclitic membrane, was not pigmented, showed sharp localization, presented no definite tubular arrangement of its epithelial cells, and lastly, the absence of blood-vessels, or any suggestion of these, was one of its prominent features.

But Alt does describe in this, and more fully in a previous article, a number of new-formations which from his illustrations and descriptions appear very similar to the one we have found. They differ in their location in the ciliary process and in the extent of their projection into the interior of the eyeball, but are alike in the involvement of but one ciliary process, the localized and segregated nature, the absence of pigment, the nature of the epithelial cells and stroma, and in the absence of blood-vessels. Interesting too, the period of life in which they are found is the same. The first four examples that Alt describes were observed in both eyes of a man who died from pneumonia, an eye removed for sarcoma of the conjunctiva, and an eye affected with panophthalmitis. In none of the cases had there been any symptoms or signs referable to the neoplasms, and their finding was wholly accidental, as was our specimen. Naturally this was due to their small size; still Alt's masses were larger than ours.

Alt called these tumors adenoma of the ciliary body in view of their gland-like tubular structure, but he tries to make clear that he does not necessarily believe the ciliary "pegs" to be true glands as Treacher Collins claims.

Previous to Alt, similar tumors were described by Pergens, Badal and Lagrange, and Michel under different names as "adenoma," "primary carcinoma," and "mixed endothelial

and epithelial carcinoma" of ciliary body respectively, while Hanke described another such tumor under the name of "an epithelial tumor of the ciliary body." He mentions some such masses as "primary melanotic tumor," "primary melanotic glandular carcinoma," "primary epithelial tumor of the ciliary body," "glioma of the pars ciliaris retinæ," and other names given by various authors. He concludes that there can no longer be any doubt that epithelial new-formations are found to spring from the two epithelial layers of the ciliary body and processes and in rare cases from the pigment epithelium of the choroid as well as the iris.

Unfortunately, because of the small size of the nodule precluding the possibility of obtaining any further sections, and on account of the fixation in formalin, any further special stains for the stroma in our case could not be made.

The tumor mass was too compact and too deeply placed to represent retraction of the anterior layer of the suspensor ligament of the lens with inclusions of the pars ciliaris retinæ. There was obviously some proliferation of the epithelial cells, as the surface area represented by them was much greater than normal. In the absence of any evidence of cyclitis or cyclitic membrane one must recognize the neoplastic nature of the mass. The relation to a fibromyxomatous tumor in view of the repeated slight traumatism of foreign bodies would be interesting, but one could make out no definite evidence of a true myxomatous change of the fibrous tissue though in part its reactions were such.

Could it be that the growth represented an overgrowth of epithelium with the development of a very dense stroma in some of the ciliary folds? That is, could it not be that these new-formations represented simple papillomatous growths with no other etiology than irritation? It is possible that, through excessive efforts to accommodate in hyperopic eyes, with elasticity of the lens lessened, the pars ciliaris retinæ becomes greatly folded, and in places where there is unequal muscular contraction may even become firmly compressed, with consequent hyperplasia of the cells of the area involved. This view is supported by the early and progressive hyperopia in the history of our case. On the other hand, it may be that the injury from numerous foreign bodies, of

which the patient speaks, points to traumatism as a possible factor.

What we have attempted to emphasize is the importance of the stroma in our case pointing to a passive character on the part of the epithelial structure.

THE PROTECTION OF THE NORMAL CRYSTALLINE LENS AGAINST THE HARMFUL EFFECT OF ULTRA-VIOLET LIGHT.

By Dr. W. E. BURGE, Nela Research Laboratory,

and Dr. A. J. NEILL, Physiological Laboratory of the University of Illinois.

(With one illustration in the text.)

THE first series of experiments described in this paper were carried out to determine whether opacity of the lens or cataract could be produced in excised pig and ox lenses by radiant energy.

I.

EFFECT OF INFRA-RED AND RED.

Sir William Crookes[1] concludes that glass-blower's cataract is due to the long waves of the spectrum. This conclusion was based on the fact that he found the radiation from molten glass in the glass-blower's furnace to be rich in red and infra-red. In the following experiments an electric furnace operating at about 1000° C. was used as its radiation is rich in red and infra-red.

Lenses fitted into floats made of thin rings of cork were almost submerged in open-mouthed vessels containing egg-white and blood serum, respectively. The vessels were placed in a tank of running water with their mouths slightly above the surface of the water. The electric furnace was inverted and placed directly over the lenses at a distance of 15*cm.* The

[1] Crookes: *Philosophical Transactions*, Royal Society of London, 1914, A–300.

preparations were exposed, in some instances for as much as one hundred hours, without the production of an opacity either in the lens or in the media. Other experiments were carried out similar to these except that the furnace was placed 5*cm* from the surface of the lenses. Under these conditions the lenses could be rendered opaque in about ten minutes. On placing a thermometer on a lens thus rendered opaque it was found that the temperature in the region of the lens was about 80° C.

EFFECT OF VISIBLE SPECTRUM.

Lenses were arranged on floats similar to those described above and almost completely immersed in egg-white and blood serum. By means of a bi-convex glass lens four inches in diameter and with a principal focal distance of approximately twelve inches, the filament of a nitrogen-filled tungsten lamp operating at 2000 cp. was focused on the lenses. In no case was opacity of the lens produced. Similar experiments were performed by focusing the image of the sun on the lenses. Opacity could be produced in a very few minutes, but in every case it was found that the temperature of the lens was raised sufficiently high to coagulate its protein.

The conclusion may be drawn that opacity of the lens cannot be produced by radiation from the region of the infra-red or of the visible spectrum provided the temperature effect be excluded.

EFFECT OF ULTRA-VIOLET.

Lenses were introduced into quartz tubes previously filled with egg-white and blood serum, respectively. The diameter of these quartz tubes was slightly less than the diameter of the lenses, so that each tube was filled in a horizontal direction by means of the immersed lens. The tubes were closed with rubber stoppers and placed horizontally in a tank of running water at a depth of 1*cm* beneath the surface of the water and 5*cm* below a Cooper Hewitt quartz mercury-vapor burner operating at about 2500 cp. The egg-white and the blood serum were firm coagula after twenty hours' exposure. The immersed lenses were, however, as transparent as at the beginning of the experiment. The experiments were con-

tinued for one hundred hours and at the end of this time there was practically no change in the transparency of the lenses.

Dryer and Hanssen[1] and others have found that practically all the proteins and related substances are either coagulated or changed in some manner by exposure to ultra-violet radiation. The lens protein seems to be an exception in that it is not coagulated. The lens possesses the property, fluorescence, by means of which it absorbs the shorter waves and radiates this absorbed energy in the form of longer waves. A provisional hypothesis is advanced that in this manner the lens disposes of more or less of the energy of the short waves and thus protects its protein from coagulation.

The above experiments would seem to show that it is practically impossible to produce an opacity of the lens or cataract by means of radiant energy from the infra-red, the visible or the ultra-violet regions of the spectrum, under conditions much more extreme than any to which the human eye is ever subjected, and hence it seems evident that there must be some factor involved in the production of cataract other than radiant energy. Analyses[2] of several thousand cataractous lenses both from the United States and from India show that there is a great increase over the normal in the amounts of certain salts. The percentage of potassium in the ash is greatly reduced, while the percentages of calcium, magnesium, and sodium are greatly increased over the amounts existing in the normal lens. In cataractous lenses obtained from the United States there was no indication of silicate, while those from India contained distinct amounts of the silicates of potassium, calcium, and possibly of sodium. This increase in calcium, magnesium, sodium, and silicon found in the cataractous lenses suggested that their presence might make possible the coagulation of the lens protein by radiant energy, even though under normal conditions radiant energy has no effect on the protein. To test this hypothesis the following series of experiments were performed, using the same apparatus as before, but with *m*/100 calcium chloride, *m*/100 magnesium chloride, and *m*/100 sodium silicate as media for the lenses. Since cataract is found as a complication of diabetes

[1] Dreyer and Hanssen: *Comptes rendus*, cxlv., 234, 1907.

[2] Burge: These ARCHIVES, xxxviii., No. 5, 447, 1909.

m/100 dextrose was also used as a medium. These solutions of themselves did not affect the transparency of the lenses after more than one hundred hours of immersion.

II.

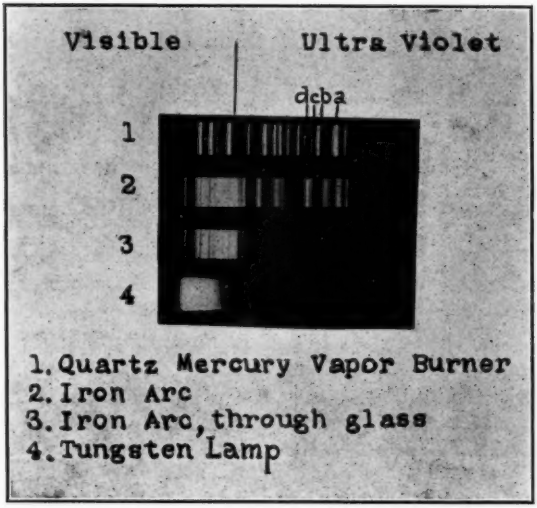
EFFECT OF INFRA-RED AND VISIBLE SPECTRUM ON LENSES IN SALT SOLUTIONS.

Lenses were immersed for two hours in *m*/100 calcium chloride, *m*/100 magnesium chloride, *m*/100 sodium silicate, and *m*/100 dextrose, respectively. They were then exposed to the radiation from the electric furnace, the tungsten nitrogen-filled lamp, and the sun. Exposures were made as in the preceding experiments without affecting the transparency of the lenses or of the media, provided the effect due to rise in temperature was excluded.

EFFECT OF ULTRA-VIOLET ON LENSES IN SALT SOLUTIONS.

Similarly quartz tubes containing similar media and immersed lenses were prepared, and after two hours were exposed to the radiation from the quartz mercury-vapor lamp. It was found that the solution in the quartz tube containing a lens immersed in *m*/100 calcium chloride became turbid after twenty-five minutes' exposure. The portion of the lens on the side next to the burner had become an opaque mass after seventy-two hours, whereas the transparency of the half of the lens away from the burner was only slightly affected. The same thing happened on the exposure of a lens immersed in *m*/100 magnesium chloride, in *m*/100 sodium silicate, and in *m*/100 dextrose, except that the effect was not so marked and was not produced so quickly as when calcium chloride was used.

Experiments were carried out using the Fuess quartz spectograph in order to determine which wave-lengths emitted by the quartz mercury-vapor arc caused the coagulation of the modified lens protein. Five lenses were placed in a .25% solution of calcium chloride for two hours. At the end of this time the clear liquid was poured off and introduced into a quartz cell. This cell was made of two quartz disks


Visible
Ultra Violet
dcba
1
2
3
4
1. Quartz Mercury Vapor Burner
2. Iron Arc
3. Iron Arc, through glass
4. Tungsten Lamp

4*cm* in diameter and 1.2*mm* thick. These disks were separated by a ring of hard rubber 0.8*mm* thick with an inside diameter of 3.8*cm*. By means of the spectograph the spectrum from an 800 cp. quartz mercury-vapor lamp was focused on the solution. At the end of fifteen hours a delicate white band of coagulated lens protein could be seen. This band was found to correspond to three fused bands in the spectrum of the ultra-violet, of wave lengths 265.2μμ, 265.3μμ, and 265.5μμ ("a," Fig. 1). At the end of twenty-four hours' exposure two more delicate white bands of coagulated lens protein were to be seen. These two bands corresponded in position to two bands in the spectrum of the ultra-violet, of wave lengths 289.3μμ and 296.3μμ, marked "b" and "c" in the photograph. In the region of 302.1μμ there was an ill-defined hazy precipitation of lens protein. From these results it would appear that the effective region in producing coagulation of the modified lens protein is between 265μμ and 302μμ and that the most effective region is around 265μμ.

The conclusion may be drawn that the lens protein, which normally cannot be coagulated by ultra-violet radiation, can be so modified by those substances found to be greatly increased in cataractous lenses that ultra-violet radiation can coagulate it and hence produce an opacity of the lens. This conclusion refers specifically to the chlorides of calcium, magnesium, and sodium, to sodium silicate, and to dextrose which is found in increased amounts in the body fluids of diabetics.

It was found that these same substances which modify the lens protein so that the short wave-lengths can coagulate it also decrease the fluorescence of the lens. This would seem to suggest that there may be some relation between the fluorescing property of the lens and its ability to resist the coagulative effect of ultra-violet radiation.

Henri[1] and others[2] have shown that bacteria are very quickly killed by exposure to ultra-violet. The following experiments were carried out to determine if fluorescing bac-

[1] Henri, Helbrommer, and de Recklinghausen: *Compt. rend. de l'Acad. des Sciences*, 1910, v. 150, p. 932.

[2] Stassano and Lematte: *Ibid.*, 1911, v. 152, p. 623.

teria are more resistant to the action of ultra-violet than the non-fluorescing.

III.

EFFECT OF ULTRA-VIOLET ON FLUORESCING AND NON-FLUORESCING BACTERIA.

The method of procedure for each kind of bacteria was as follows: A solution of .9 % sodium chloride containing the bacteria to be exposed to ultra violet was filtered through a fine-grained filter. Two cubic centimeters of the perfectly clear filtrate were introduced into each of ten quartz tubes of a capacity of approximately 9*cc*. These tubes were placed 30*cm* from a Cooper Hewitt quartz mercury-vapor lamp operating at 2400 cp. At the end of twenty-second intervals a tube was removed. In this manner solutions were obtained which had been exposed to ultra-violet 20, 40, 60, 80, 100, 120, 140, 160, 180, and 200 seconds, respectively. Each solution was plated and the number of bacteria counted, according to ordinary bacteriological methods, at the end of forty-eight hours' incubation.

The results of the experiments are given in the tables on the following pages.

It may be seen from the tables that of the seven different kinds of non-fluorescing bacteria none were alive after an exposure of two hundred seconds, while of the eight different types of fluorescing bacteria none of the cultures were completely destroyed after an exposure for the same length of time.

CONCLUSIONS.

1. Cataract or opacity of excised pig and ox lenses cannot be produced by means of radiant energy from the infra-red, the visible, or the ultra-violet regions of the spectrum, under conditions much more extreme than any to which the human eye is ever subjected, provided the heat effect be excluded.

2. The lens protein can be so modified by weak solutions of the salts that are found in cataractous lenses and by dextrose that ultra-violet radiation can produce coagulation and hence opacity of the lens or cataract.

TABLE I.

NON-FLUORESCING BACTERIA.

Time of Exposure	Number of B. subtilis	Number of B. mucosus capsulatus	Number of B. proteus vulgaris	Number of B. violaceus	Number of Micrococcus capsulatus	Number of B. coli communis	Number of Sarcina aurantiaca
0 Sec.	13,000,000	24,000,000	295,000,000	27,000,000	28,000,000	29,000,000	195,000,000
20 "	———	———	———	———	———	———	———
40 "	———	———	———	———	———	———	———
60 "	13	460	2480	83	171	378	4820
80 "	7	112	79	60	4	9	60
100 "	7	107	71	20	2	1	10
120 "	6	8	4	5	2	0	2
140 "	4	6	2	4	1	0	1
160 "	2	5	2	0	0	0	0
180 "	1	0	1	0	0	0	0
200 "	0	0	0	0	0	0	0

NOTE: It was not deemed necessary to count the bacteria after the 20 and 40 seconds' exposures, hence the numbers of bacteria for these periods are not given in the tables.

3. The same substances which modify the lens protein so that ultra-violet radiation can produce opacity also decrease the fluorescence of the lens.

4. Fluorescent bacteria are more resistant to the action of ultra-violet radiation than non-fluorescing.

5. A provisional hypothesis is advanced that the great resistance exhibited by the lens and by fluorescing bacteria

TABLE II.

FLUORESCING BACTERIA.

Time of Exposure	Number of Bacteria A	Number of Bacteria B	Number of Bacteria C	Number of Bacteria D	Number of Bacteria E	Number of Bacteria F	Number of Bacteria G	Number of B. pyocyaneus
0 Sec.	72,000,000	80,000,000	28,000,000	70,000,000	75,000,000	33,000,000	25,000,000	79,000,000
20 "	———	———	———	———	———	———	———	———
40 "	———	———	———	———	———	———	———	———
60 "	750	813	55	210	460	12	361	88
80 "	459	623	29	79	211	10	112	20
100 "	223	221	25	56	113	7	18	14
120 "	129	102	20	29	103	5	8	12
140 "	97	88	15	18	56	4	6	8
160 "	81	73	12	13	38	3	6	2
180 "	43	29	10	6	25	3	5	1
200 "	31	15	3	3	11	2	4	1

NOTE: It was not deemed necessary to count the bacteria after the 20 and 40 seconds' exposures, hence the numbers of bacteria for these periods are not given in the tables.

to the action of ultra-violet may be due to this power of fluorescing. The assumption is that the lens and fluorescing bacteria by converting the absorbed short waves into longer waves get rid of more or less of the energy which otherwise would have been spent in coagulating their protein.

SOME UNUSUAL CHANGES IN THE VISUAL FIELDS.

THE RESULT OF VASCULAR LESIONS IN THE BRAIN AND OPTIC NERVES.[1]

By WILLIAM CAMPBELL POSEY, M.D., PHILADELPHIA.

(With 10 illustrations in the text.)

CASE 1.—*Permanent quadrant and hemianopic losses following so-called "migrainous attacks."*

Five weeks ago, I was asked to examine the eyes of a woman, aged 46, with a visual disturbance of several days' standing. It was stated that the patient had always enjoyed the best of health until the present attack, which she ascribed to the effects of a late supper of beer and Welsh rabbit, becoming overheated from dancing, and a cold ride home in a taxicab. The morning after these indiscretions, she awoke with a dull headache and blurred vision, and, thinking herself bilious, took calomel and castor oil, without, however, procuring any abatement in her symptoms, the headache, which was chiefly centered over the right eye, and the loss of sight, which seemed to be confined to the same eye, still persisting. It was at this juncture that my advice was sought and an ophthalmic examination instituted. It needed but the most cursory test to determine that her visual defect depended on a right lateral homonymous hemianopsia, though this was resolved by perimetric test into a quadrant defect merely, the lower portion of both temporal halves being normal (Fig. 1). The fixation points and the nasal fields were also uninvolved. There were no accompanying sensory or motor disturbances, and cerebration was clear. The examination of the urine was negative. Corrected vision was normal in each eye and there were no changes in the extraocular or intraocular muscles. Both fundi were normal, save for marked signs of vascular sclero-

[1] Read by invitation before the Section on Ophthalmology and Otology of the Baltimore City Medical Society, Feb. 17, 1915.

sis, the walls of both retinal arteries and veins being thickened and the vessels themselves unduly tortuous. In close association with the right inferior retinal artery, there was a small vascular new-formation, one-fourth the size of the disk, which either marked the site of a previous hemorrhage or depended on an aneurysmal dilatation of the artery. The patient was confined to her bed with a low diet and quiet enjoined. It was elicited that although she had been in the habit of taking several cocktails daily and keeping late hours, her health had been of the best. She had never suffered previously from migraine or any form of head pain. After a week or more of absolute rest and liquid diet, alteratives were prescribed and more freedom in her movements tolerated. There was no recurrence of the head pain, but the loss in the field of vision still persisted. This may be ascribed, in all likelihood, to definite changes produced in the visual cells of the left cuneus, in consequence of an interference with their function from intestinal toxæmia, either from hemorrhage or by reason of the formation of a thrombosis in the terminal artery supplying them, or as a result of prolonged spasm of the walls of the vessel.

A careful search through the literature revealed a number of somewhat analogous cases. Of these, Hun's[1] is the most instructive. In this instance a homonymous loss in the lower left quadrant of each eye was found at necropsy to have been occasioned by an atrophy of the lower half of the right cuneus (Figs. 2 and 3). This case occurred in a man, aged 57 years, of extremely nervous temperament. The visual affection came on during an attack of vertigo and mental confusion, after several premonitory spells of a somewhat similar nature. Death occurred two years later from angina.

From an inspection of the plates in Seguin's article which represent the cortical lesions which have been found in cases of hemianopsia, Hun was forced to the conclusion that the fibers from the right upper quadrant of each retina have their final termination in the lower half of the right cuneus, and the fibers from the right lower quadrant of each retina terminate in the adjacent part of the right median occipito-temporal convolution. Of course the same relationship holds good between the left half of each retina and the left cuneus and left median occipito-temporal convolution.

[1] Hun: *Am. Jour. Med. Sc.*, January, 1887.

Spiller[1] quotes a case of quadrant anopsia, reported by Beevor and Collier,[2] with necropsy and careful microscopic study, which is exceedingly valuable in determining the location of the cortical lesion causing quadrant anopsia. The only symptom of nervous disease was blindness of the left upper quadrants of both visual fields, the fixation point escaping. This condition remained constant nearly two years. Necropsy showed that an occlusive lesion of the right posterior calcarine artery had caused destruction of the cortex (1) of the right fusiform lobe for its posterior two centimeters, (2) of the right lingual lobe from the junction of the calcarine and parieto-occipital fissures to the pole of the hemisphere, (3) of the whole cortex in the depth of the calcarine fissure, (4) of the greater part of the inferior cuneal gyrus, small areas only at the anterior and posterior limits of this gyrus being free. The necrosis did not involve the optic radiations at any

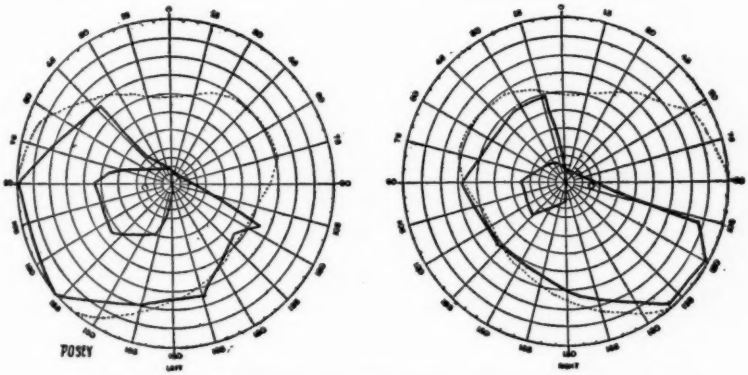


FIG. 1.—Loss of homonymous right upper quadrants, still persisting five weeks after a mild attack of auto-intoxication with headache.

point. The only parts of the cortex of the mesial aspect of the occipital lobe which had escaped destruction were the upper two-thirds of the cuneus and the anterior and ventral portion of the fusiform gyrus. As the lower quadrants of the visual fields were entirely uninvolved, the left upper quad-

[1] Spiller: *The Eye and Nervous System.*

[2] Beevor and Collier: *Brain*, 1904.

rants alone being affected, it would appear from this case at least that the cortex of the upper two-thirds of the cuneus is the visual center for the lower quadrants.

The cortex lining the calcarine fissure was completely necrotic. Beevor and Collier think, therefore, that the primary half-vision center cannot be limited to the calcarine cortex, nor the macula be exclusively represented in the anterior portion of this region. Spiller is of the opinion that the consideration of this case modifies the sharp distinctions made by Henschen in the relation of the upper and lower fields to the calcarine fissure, for the necropsy would seem to indicate that the lower part of the retina appears to be represented in the upper lip of the calcarine fissure.

In 1894, Weymann[1] described a case in which the defects in the visual fields consisted of homonymous quadrant losses in the upper left field, and similar defects in the lower right field of each eye (Fig. 4). The loss in vision in this instance occurred in a syphilitic adult male, and dated from an attack

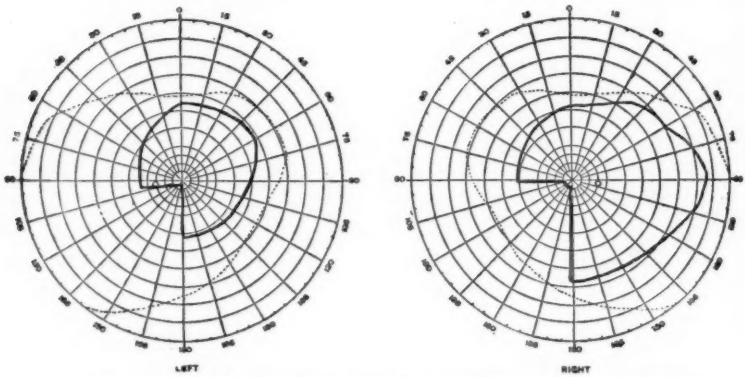


FIG. 2.—Loss of homonymous left lower quadrant, subsequent necropsy showing area of softening in cuneus (from Hun, *American Journal of the Medical Sciences*, January, 1887).

of unconsciousness followed by right hemiplegia. Later speech became thick and unintelligible, and the mentality seemed at times entirely suspended. There was incontinence

[1] Weymann: *Am. Jour. Ophth.*, October, 1894.

of feces and urine. Mixed treatment brought about a marked improvement in all the symptoms, enabling the patient to resume his occupation of dancing master. The defects in the visual fields, however, remained unchanged. Weymann thought them to be dependent on a lesion in each cuneus.

In another case of left quadrant hemianopsia, reported by Gowers, in which the loss in the field was complete for color, but partial only for form, there was associated left hemiplegia. Necropsy showed each cuneus to be normal, but a patch of softening was found in the right internal capsule. Gowers suggests that a partial lesion may have temporarily damaged the whole half-vision center, or possibly injury to the optic radiations may have cleared up partially, leaving the fibers of one section destroyed.

Homonymous quadrant defects in the visual fields are of rather rare occurrence from any condition, and, as far as I am able to discover, these few cases just quoted are the only

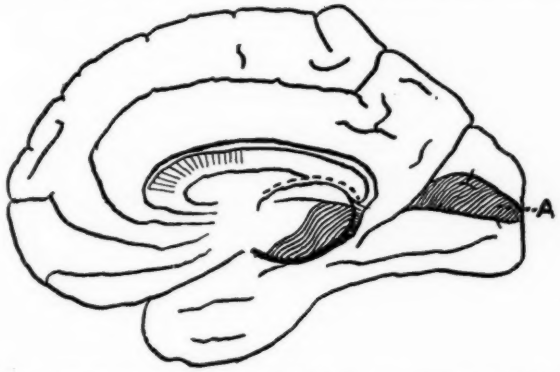


FIG. 3.—Median aspect of right hemisphere; *A*, cuneus, point of attack (from Hun, *American Journal of the Medical Sciences*, January, 1887).

instances which occur in the literature which are at all similar to the case I have described.

More often the visual loss consists in a full hemianopic defect, as exemplified by the following:

CASE 2.—In May of last year, Mrs. F. W. B., aged 33 years, was referred to me by Dr. C. H. Frazier, on account

of a loss in the right field of vision. This had followed an attack of severe pain in the left side of the head, accompanied by loss in sensation and motion of the right arm and leg. Sensation returned in the paralyzed side about two hours after the attack, and motion some time later, but the visual defect persisted. Following the attack she stated she experienced from time to time a peculiar kind of headache, which she described as a creeping sensation, which began in the occiput and slowly extended to the vertex. Two months prior to the examination, during a spell of severe localized pain in the right side of the head, she thought that there had been a partial return of sight in the outer part of the right field of vision. She ascribed her head symptoms to typhoid fever, which was followed by a post-typhoid infection of the gall-bladder. A number of gallstones had been removed by operation, but a fistula remained which demanded a second operation for its healing. The examination of the eyes was negative, save for the changes in the fields, which consisted, as may be seen by the accompanying charts (Fig. 5), of right homonymous hemianopsia. Though complete in the left eye, the hemianopic area in the right eye was incomplete, for in the

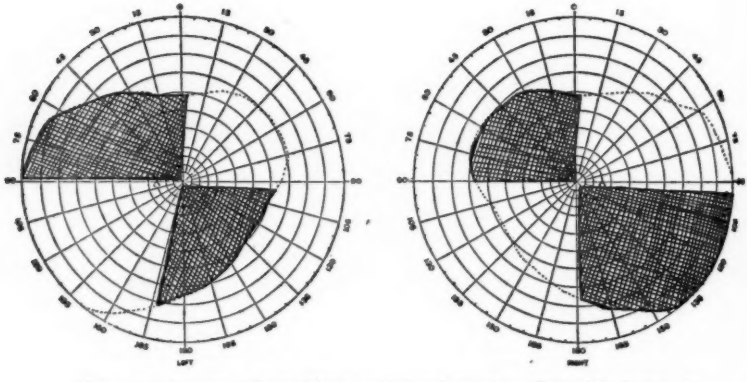


FIG. 4.—A case of quadrisectoral hemianopsia. Probable lesion in each cuneus (from Weymann, *American Journal of Ophthalmology*, October, 1894).

extreme temporal periphery a small island of uninvolved field area could be distinctly mapped out with a 10*mm* white object. A second perimetric test made two months later gave similar findings. In a recent letter, the patient stated

that her general physical condition had improved. There had been no return of the head pain, but she was unable to note an improvement in her sight. She writes: "The spot of sight in the right eye (the uninvolved area in the periphery) is slightly larger, but the big shadow is spreading left toward the center of the eye." The case was regarded by Dr. Frazier and Dr. Spiller, who was also seen in consultation, as one of migraine with persistence of the hemianopic defects in the field. Dr. Spiller located the lesion near the left internal capsule, implicating the optic radiations and interfering temporarily with the sensory and motor fibers in the internal capsule, probably by vascular disturbance and resulting congestion. The possibility of thrombosis must, however, also be considered.

To this case a number from the literature may be added, and as some of these came to necropsy, considerable light is thrown on the sublying pathologic lesion causing the hemianopsia.

Of these, the case most referred to is that of Hoeflmayer, who noted the persistence of hemianopsia for a month in a woman aged 57, who had frequent attacks of migraine for forty years. The hemianopsia appeared after a prolonged attack, in which the patient lay in a stuporous state for ten days. The hemianopsia cleared gradually, at first the outline

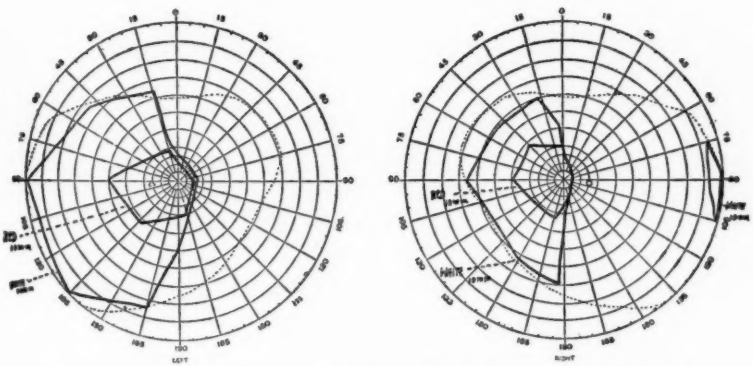


FIG. 5.—Right homonymous hemianopsia with preservation of a small area in extreme periphery of right field, persisting sixteen months after an attack of migraine. Right eye: Lesion near left internal capsule implicating optic radiations, etc.

of objects being seen dimly and then more and more clearly, until normal fields of vision supervened. Hoeflmayer thought the condition a toxic one, added to a neurasthenic exhaustion.

Févé's case of a woman aged 34, of permanent hemianopsia with preceding evanescent attacks of vertigo and hemiplegia, was doubtless due to organic cerebral disease; also Charcot's, of a patient who a year before, in consequence of an attack of hereditary migraine with temporary aphasia, was left with hemianopsia, which did not disappear. Migraine attacks of less severity continued at longer intervals.

In Noyes's case, that of a man aged 52, severe attacks of migraine with vomiting had occurred frequently during ten years. Finally, in a sharp attack, after violent vomiting, typical left lateral hemianopsia followed, with a concentric limitation of the nasal half of the field of the left eye. Death occurred three years later from cerebral hemorrhage. A clot was found in the right cuneus.

In a case of ophthalmic migraine seen by Huguenin, with hemianopsia and aphasia, an obliteration of the artery of the

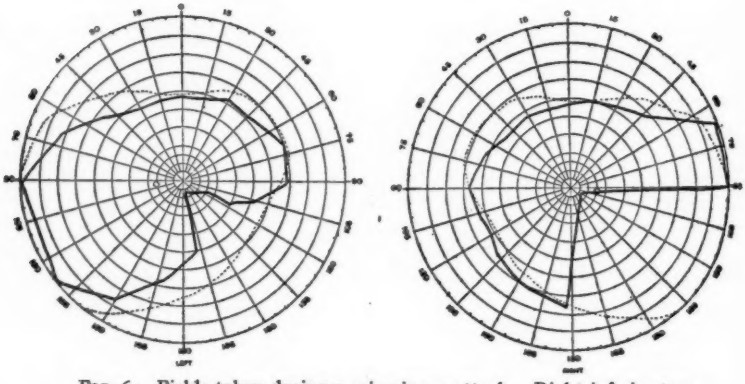


FIG. 6.—Fields taken during a migrainous attack. Right inferior temporal quadrant loss.

fossa of Sylvius was found at the necropsy. To these may be added three additional cases by Thomas of Boston. The first one seemed, from the history, the absence of heredity and the nature of the attack itself, to have been due to arterial disease,

and it is probable that the migraine attack was no more than an exciting cause for the vascular lesion, and possibly only a symptomatic migraine. Thomas thought the second, and particularly the third case, to be clear instances of cerebral softening ascribable to attacks of migraine. In the second case the presence of sugar in the urine was only temporary, it being absent in two later examinations, and present only at the first test, so that it was probably symptomatic only. In neither case was there any evidence of kidney, heart, or arterial disease, or of syphilis.

As appears from the foregoing, there is ample evidence in the literature that migraine may be the exciting cause of organic brain disease, and that an area of softening of the brain may follow, which may manifest itself by a permanent paralysis, aphasia or hemianopsia. While such lesions usually occur in individuals who are predisposed in consequence of disease of the walls of the blood-vessels, it would seem that in certain cases the vascular lesion may occur in young persons and even in some adults with healthy vessels. Caution,

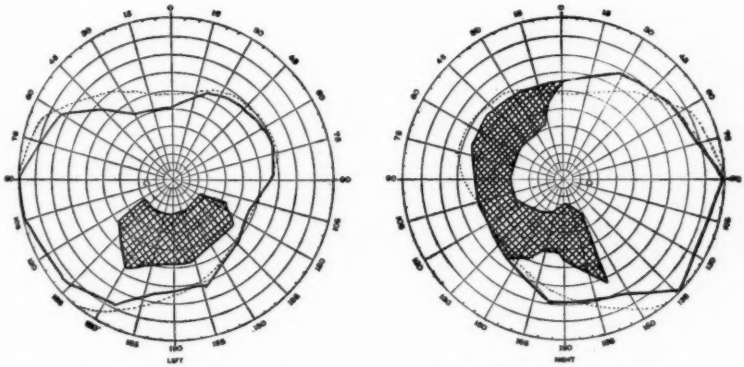


FIG. 7.—Fields taken during a migrainous attack. Scotoma is now hemianopic in type in the right eye, and is on the nasal side. In the left eye the scotoma occupies the lower field.

however, must be observed in ascribing even an exciting rôle to migraine in cases of organic brain disease, as it is not unlikely that independent disease of the blood-vessels is respon-

sible for the resultant symptoms, and the migraine merely coincident.

Finally, before closing the subject of migraine, I will cite the history of a case which is of interest on account of the presence of a hallucination in the blind area, and also because of the fact that I had the opportunity of obtaining careful fields at the height of an attack.

CASE 3.—This case occurred early in my professional career, about twenty years ago, and was described in a paper entitled "Visual Perceptions as Symptoms of Disease."

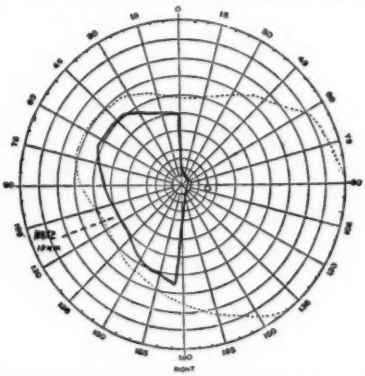


FIG. 8.—Left eye blind from thrombosis of the central artery of the retina. Temporal field of right eye lost from central apoplexy, right nasal field alone remaining.

An abbreviated account of the case is as follows: After a number of ordinary migrainous attacks, the patient, a neurotic woman aged 30, suffered one rather more severe, in which she saw a large blue eye the size of a bull's in the dark area of the field of vision. The eye was in rapid motion and was projected to the right on her blind side and was visible even with closed eyes. Its appearance was succeeded by an intense throbbing pain in the left temporal region. Synchronously she had a sense of numbness in her right side from the shoulder down. After persisting a few minutes, the eye would disappear, but would reappear about every twenty minutes. The fields, which were taken at a period when the scotoma was present, showed a partial right inferior temporal quadrant loss (Fig. 6).

A few days later she returned with another attack, when

a second perimetric study was made. These assumed a different type from those first made, the defect being now on the left side (Fig. 7 A). It was only when the headache was most intense that the scotoma was positive, for at other times objects could be seen in it, although with changed appearance. For example, the white quadrant of the perimeter would often appear bisected, or, again, one corner would be cut off; again, it would seem very minute, and at times it would be lost altogether. Colors were not perceived in the area of the scotoma. Directly after this

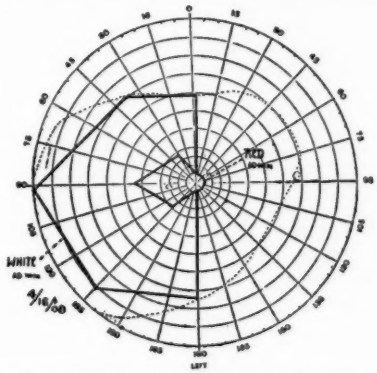


FIG. 9.—Monolateral nasal hemianopsia of left eye from pressure atrophy in consequence of atheroma of the vessels of the optic nerve (?).

field was secured, the right eye was bandaged, and the field of the left eye studied. Here the scotoma was directly below, and presented the same characteristics as that of the fellow eye. When the scotoma left the field, it could always be reproduced by testing the field in that position. On the tendency which the scotoma had to shift about being remarked, the field of the right eye was taken once more, as shown in Figure 7 B. The scotoma was now in the inferior portion of the field, and corresponded to that which was observed in the left eye. It is interesting to note the rapidity with which the scotoma shifted itself about. Although taken very carefully, the fields were rapidly obtained by the McHardy perimeter, so that not more than half an hour was consumed in obtaining the two. When the tests were being made, the patient was perfectly calm and collected, and there were no manifestations of vasomotor changes in the face. At no time did the scotoma involve the fixation point. It was curious to note the way in which the patient

described the object when viewed in the affected area. At times it would appear glistening white and rapidly fade out of sight, and then again it would have the peculiar distorted outlines just referred to. At times the white object would appear red, again blue, and then a variety of colors.

CASE 4.—*Left eye blind from thrombosis of central artery of the retina. Temporal field of right eye lost from cerebral apoplexy, right nasal field alone remaining.*

I have had under my care for many years an old lady, now 90 years of age, who typifies to a marked degree the con-

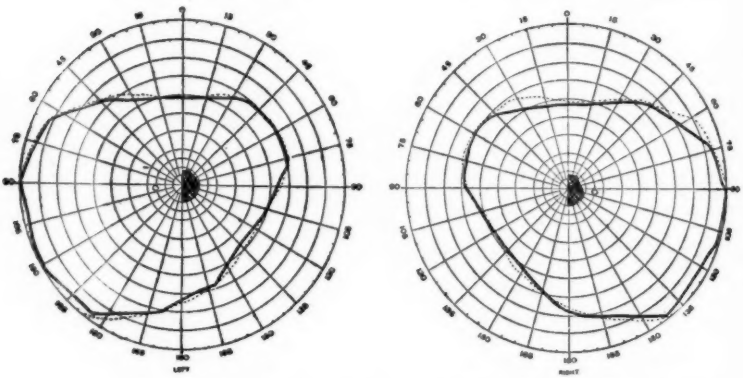


FIG. 10.—Right homonymous hemianopsia in the macular regions from blocking of an end artery in or near the cortical center of the visual area.

sequences which extreme vascular disease may have on the eyes. Ten years ago, the sight of the left eye was suddenly lost from stoppage of the central artery of the retina. As there had been pronounced changes in the retinal vessels for years, the interruption of the blood current was thought to be due to thrombosis, though the premonitory, transient attacks of blindness which usually accompany that condition were absent. Although seen a few days after the loss of sight had supervened, there were no changes discernible in the fundus, with the exception of a marked diminution in the size of the blood-vessels. Several years later she suffered a right hemiplegia, with a loss of the temporal field of the right eye, leaving her with but the nasal half (Fig. 8). This field is becoming more and more restricted from an atrophic condition of the nerve, which is apparently due to local arterial sclerosis.

CASE 5.—*Unilateral optic atrophy and contralateral hemiplegia consequent on occlusion of the cerebral vessels.*

Under this title, Cadwalader of Philadelphia described a case of a man aged 35 in whom there was associated nearly complete motor aphasia, marked weakness of the right side of the face, cerebral in type, with spastic paralysis of the right arm and leg. Vision of the right eye was normal, but the left eye was totally blind. The right optic nerve was gray, but in the left eye there was optic atrophy with a reduction of the arteries to mere threads. Cadwalader thought the symptoms could be explained by necropsies performed on similar cases of Batten and Guthrie, of Jackson and of Gowers, in which an embolic mass was found to have been carried through the internal carotid artery into the middle cerebral vessel, producing apoplexy and hemiplegia, while a portion of the clot was swept into the ophthalmic artery. as it branched from the internal carotid. It was thought that in some instances the clot might lodge in the central artery of the retina itself, producing sudden blindness and atrophy.

CASE 6.—*Monolateral nasal hemianopsia of the left eye from pressure atrophy in consequence of atheroma of the ophthalmic artery (?).*

Ophthalmologists have devoted considerable attention to the effect exerted on the optic nerve by a sclerosis of the vessels in association with it. The late C. S. Bull and Zentmayer, in our own country, have referred to it in comparatively recent monographs. Perhaps the first comprehensive paper on the subject, however, was by Otto in 1893, who "described cases of circumscribed atrophy of the optic nerve caused by a sclerosis of the internal carotid and ophthalmic arteries, which induced dilatation of the breadth of these vessels in places, hardening of their walls, and pressure on the optic nerve by mechanical means. Sections of the optic nerve showed the effects of pressure by the enlarged carotid and ophthalmic arteries on the optic nerve behind the foramen, in the form of flattening and incurvation of the nerve as a whole, and flattening of the central nerve-fiber bundles and circumscribed atrophy of the central and marginal nerve-fiber bundles." Otto also traced out both ascending and descending atrophy of the nerve fibers in these cases. He affirmed that the flattening of the central nerve-fiber bundles on both sides,

distal and proximal, of the atrophic zone, corresponding to the pressure of the enlarged vessels, is always present.

In 1902, Liebrecht studied seven cases from an anatomical standpoint and attempted a classification of the three sites at which pressure on the nerve would be most likely to occur. Lack of time forbids further consideration of this subject. Bull's conclusions may, however, be cited: "Wherever the location of the pressure, the resulting atrophy of the nerve is at first a pure pressure atrophy, which is propagated downward and forward toward the disk, and upward and backward toward the chiasm. Later in the course of the disease, there is probably added a secondary proliferation of connective tissue between the nerve-fiber bundles, which induces a more extensive atrophy and perhaps the development of new vessels. The atrophic zone at first extends but a short distance from the zone of pressure. Where it actually reaches the disk, we must assume the existence of a secondary complicating atrophy in the optic nerve, the result of connective-tissue proliferation."

An example of probable pressure atrophy of the optic nerve from sclerosis of one of the larger vessels in association with the nerve, more likely the ophthalmic artery, is the case of Mrs. T., now in the nineties, who first consulted me about fifteen years ago, on account of loss of vision in the left eye. This had come on, she thought, rather suddenly several months before. As shown by the accompanying field (Fig. 9), the visual defect was found to consist in a complete nasal hemianopsia, with preservation of fixation. The nerve was pale, bluish-white, and avascular, and the retinal vessels much diminished in size. Corrected vision equaled $\frac{5}{12}$. The right eye was normal, save for signs of pronounced arteriosclerosis, both in the nerve and retinal vessels. There was no limitation of the field of vision. This case has been under more or less constant observation ever since and the fields have remained unchanged, the hemianopic field still persisting, and no other limitation being remarked in the remaining field of the left eye, or in that of the right. Central vision still remains as at the first examination.

CASE 7.—*Right homonymous hemianopsia confined to the macular regions from blocking of an end artery in or near the cortical center of the visual area.*

A rare lesion in the fields is that of a hemianopic defect confined to the macular regions. I have seen but one case of this kind, which I have already reported elsewhere.[1] This occurred in a man aged 56, a sufferer from rheumatoid arthritis for many years, whose disturbance in vision occurred in association with some dizziness and confusion of mind and speech. These symptoms cleared away after several days, and the only resultant disability seemed to be in reading from type, distant sight appearing normal. A careful functional examination of the eyes showed them to be normal in all respects save for a loss of vision in the macular region of both eyes, as per fields (Fig. 10). Corrected distant vision was normal. This condition persisted until the death of the patient a year later from apoplexy.

This defect in the visual fields in association with cerebral disease was called attention to by Mills, in 1898, in his textbook on Nervous Diseases, although Wilbrand, in 1907, in a paper entitled "The Macular Hemianopic Disturbance of Reading and von Monakow's Projection of the Visual Sphere," in which he reported eight cases observed by him, was the first to give a detailed analysis of the condition. As pointed out by him, central vision is normal, the scotomas which are negative and very small and paracentral, being generally unobserved in distant vision. Great difficulty, however, is experienced in reading, especially of fine print. For in the act of reading, as Wilbrand points out, the finest details of the letters must be recognized. Thus, in ordinary reading, the initial letter of the first line is fixed directly, the rest of the word and perhaps the word following being seen by indirect vision. As soon as this impression is received, the eyes spring to the right and another initial letter is fixed directly and what follows to the right indirectly. When the end of the line is reached the eyes make a longer jump to the left, beginning a new line below. Movements to the right are fewer when the subject is able to comprehend more words in anticipating the sense of the text. When in macular hemianopsia the scotomas lie to the right, there is difficulty in indirect vision, and every syllable of each word must be painfully fixed; when, on the other hand, the scotomas lie on the left of fixation, there is great difficulty in finding the commencement of each line.

[1] Posey, W. C.: May, *Ophth. Rec.*, 1908.

When the letters are small, short words and letters disappear entirely.

As Wilbrand points out, it is not difficult to confuse the uncertainty and hesitation which subjects of this condition have in reading with dyslexia and alexia, this being particularly the case when the scotomas reach the fixation points, so that in all suspected cases, a rough test of the field of vision is insufficient and careful search should be made for scotoma by sufficiently small test objects.

Wilbrand is of the opinion that the scotomas under consideration appear when an end artery in or near the cortical center of the visual area becomes blocked up, and believes that the calcarine artery, which runs in a deep fissure on the medial side of the occipital lobe, supplying the largest and most important of the visual radiations, is the vessel chiefly implicated.

In two of his cases the probability of emboli was rendered likely by the presence of mitral and aortic insufficiency. In other cases circumscribed, septic encephalitis, and syphilitic disease of the vessels with thrombosis were possible causal factors. In another case the cause of the hemianopsia appeared more direct, for in this instance a small iron screw, which projected about 13*mm* above the level of its support, penetrated a woman's skull in the region of the left visual center. When the thickness of the scalp and skull was considered, but a very shallow penetration of the skull cavity was possible.

VISION: ITS ECONOMIC VALUE AND CONSERVATION.[1]

BY LLOYD B. WHITHAM, M.D.,

ASSITANTS IN OPHTHALMOLOGY, JOHNS HOPKINS UNIVERSITY; ASSISTANT OPHTHALMIC SURGEON, JOHNS HOPKINS HOSPITAL DISPENSARY AND BALTIMORE EYE, EAR, AND THROAT CHARITY HOSPITAL; CONSULTING OPHTHALMOLOGIST, ROBERT GARRETT HOSPITAL FOR CHILDREN, HOME FOR INCURABLES, etc.

CONSERVATION! How often, of late years, have we heard the word! Conservation of natural resources, forest lands, mineral deposits, animal or vegetable wealth, and what not! Is it but natural, then, that, at a time when public-spirited men and profound thinkers, the world over, are struggling with vast economic problems of physical, commercial, social, and scientific interest, when the tax rates and cost of living are steadily ascending, when the labor question has become so pertinent and vital, that the minds of medical men, social workers, economists, and the like should be drawn into the current of thought, started, twenty-seven years ago, by Woods, Howe, and others, now, through practical application, grown into a mighty river of conviction? I refer to the researches into the subject of preventable blindness, the economic statistics evolved, and the rapid strides in prophylactic legislation and public education which have been made in the past few years.

Following its first exploitation, the subject received little attention for a number of years, but, after a while, the American Medical Association took the matter up, and appointed a committee which collected some classical data on blindness,

[1] Read at the meeting of the Howard County Medical Society, April 6, 1915, at Ellicott City, Md.

and made a study of the immediate causes and underlying conditions. Later the Russell Sage Foundation was organized and started its magnificent work, now known and applauded the world over. This foundation finances the fight against preventable blindness, conducts scientific investigations by salaried and expert social workers, distributes instructive literature, and helps to promote, in whatever manner possible, knowledge where needed. Through the medium of this foundation professional men, social servitors, philanthropists, altruists, and a most representative coterie of citizens have united in a common cause and are working side-by-side, shoulder-to-shoulder, in what promises to be the most successful propaganda of public education which has ever been instituted in this country.

And, when we pause to reflect, what is the conserving of timber tracts, coal lands, and so forth, when compared with the God-given treasure, Vision, which, in a large measure, makes possible man's greatest achievements and discoveries! However, I am not here to dwell, in a humanitarian way, upon the pathetic side of blindness (a state to which many of those afflicted prefer death), but to discourse, in a business-like manner, upon its baleful influences in a thriving, civilized community, the tremendous monetary waste involved, the loss of good citizens and their possible achievements, the moral effect of bad management, poor legislative and medical protection, and a score of such inter-related considerations, and to review what is so well known to and so little regarded by some of us: our civic obligations, not only as taxpayers and voters, but as physicians, responsible for the health of the people. We cannot lightly pass this subject by, dry and uninteresting as it may be, who are, in so large a measure, either actively or, what is perhaps worse, passively to blame for the remediable conditions bringing about this very state of affairs.

There has been no particular effort made by medical journals, aside from that of the American Medical Association and the ARCHIVES OF OPHTHALMOLOGY, to keep the profession informed as to the progress of the Conservation of Vision Movement in various parts of the country and in the world at large. It is doubtful whether more than a few in our pro-

fession, barring those who have made a study of the problem, are conversant with the work that has been done in the past, with the present status of the movement, and with the various plans for the future evolved in different communities. It is hoped that, some day, there will be an acknowledged central organization, which will keep in touch with the work done in various states, and will publish, from time to time, useful information as it accumulates, "each commonwealth having its own peculiar problems, climatic, hygienic, and legislative, to deal with."

Economically, the conservation of vision can be rated almost as high as the conservation of life, from some standpoints higher, for, when dead, a man imposes no burden of upkeep upon the public, his widow can re-marry and be supported, together with her children, by another obliging man, so that affairs naturally readjust themselves. Not so with the blind, for that pitiful, useless human machine, though he may learn to make brooms, weave baskets, and so forth, must, to his dying day, be housed, clothed, fed, and, in not a few instances, those dependent upon him as well, in view of the miserable status, until this year, of compensation for those blinded by industrial accidents in the United States. Where we read or hear of one blind person who is self-supporting, the lists show scores who are wellnigh useless as far as earning capacity is concerned. How many Miltons, how many Gores, how many Kellers has the world seen? Assume that Pasteur, Lister, or Koch had been born blind! Think you that we should ever have heard of them? Without the lamp Vision, the garrets of their brains would forever have remained unexplored and musty! But enough of this digression. Let us return to cold, remorseless facts. To what extent has this economic aspect of the situation been investigated and what authentic data have accumulated?

In the first place, what do we mean when we speak of blindness? Of course it is technically defined as "incurable, total loss of sight." The popular definition of it, however, is "that condition in which the sight is so diminished that any occupation requiring the use of the eyes is impracticable."

It costs about $15,000,000 to support the 300,000 blind dependents in the United States! This does not include

privately supported blind persons, nor enter into the potential loss in work, achievements, etc., which will be considered later.

The Maryland appropriation was $45,000 for the School for the Blind, which educates 200 children, and $10,000 for the Workshop for the Blind, or a total appropriation of $55,000. For the latter, for the next two years, an additional $5000 has been decided upon, which will bring the total up to $60,000 a year. For each one in the school $350 is allowed, whereas for the adults $150 is the least amount. This is a mere trifle! The biennial appropriation of Pennsylvania was $265,000, and New York's yearly grant was $110,000. Of course these amounts are not a fair estimate of the cost, as private gifts, bequests, and so forth are not included.

The board and clothing, however, are the smallest items in this interesting investigation. As these people are non-producers we must add what they would have contributed toward the national wealth had they been able to work. Twenty-three years ago Woods spoke upon this very subject. At that time, estimating the wages of a man at $1.20 a day, and a woman at 40 cents a day, he found in 1887 a loss of $25,000,000. Since that time the value of labor has increased with the multiplication of our industries and our constantly increasing export trade, so that this estimate would be far too low for the present monetary loss to the nation. In fact, when we realize that the exercise of practically all the trades or professions open to man depends, almost absolutely, upon good eyesight, the economic factor becomes more than evident, it becomes appalling!

In estimating the expenditure of the commonwealth's moneys we must not overlook another appropriation, the public schools. One is astonished when shown, as Wessels has done his readers, the cost of the education of children with defective vision who, because their efficiency is impaired by poor eyesight, stay in the same class for two, three, or more years. In Philadelphia, under normal conditions, a pupil of fourteen years reaches the eighth grade at a cost to the State of $280. If the child with defective vision reaches only the fourth grade in that time, it has cost the State $280 with $140 worth of result, a loss to the State of $140

for each backward child. Of 7319 cases, examined by Wessels in four years, 72% were backward, representing a composite loss in money of $414,685 for those children alone. New York City has 650,000 public school children, 30% of whom are two years behind in their natural grades! Reflect upon the total waste from this state of affairs! But the child's loss is greater, for he is likely to be put to work at that age, 14 years, poorly equipped for the struggle of existence, his earning power curtailed for the want of an education, so that he can contribute but little toward his family's support or toward the State which again loses, loses money, loses a valuable worker or thinker, loses a useful citizen and, perhaps, gains a rogue to support, because of neglect of eye examination and proper treatment at the receptive, moldable age in the child's life. As Allport puts it: "To such children school work is a pain and a burden. They are always behind their classes, sometimes remaining in one room year after year, an exasperation to their teachers and discouragement to themselves. Unless relieved and rendered fit for study, they are regarded as mentally deficient and morally vicious, become personally disheartened and truant, drift into bad society and associations, commit small and then greater crimes, and eventually may enter the criminal classes, and then become an expense and care to the commonwealth as police court defendants, and as dwellers in asylums, institutions, and prisons." Surely, "education is the greatest enemy to crime!"

So it will be seen that our statistics as to the appropriations for blind asylums do not cover the expense, and that we can count some of that appropriated for hospitals, prisons, houses of correction and sundry asylums, simply because some eye condition, neglected during the formative age, has indirectly driven a number of the inmates there as State charges, whereas, had they been started aright, the potential power of these outcasts would be incalculable.

One of the most vital elements in the economic question is presented by accidents, principally industrial. It requires no very vivid imagination to picture the workman, after years of apprenticeship, expert in some one particular line, invaluable to his employers, supporting a large family, endeavoring to educate his children and give us even better citizens, suddenly

rendered blind by a perfectly preventable accident, made practically useless for life, earning capacity rendered nil, expert ability gone forever!

But, when one eye only is injured, one might think that the man could do his work just as well, provided the other eye retained its vision and sympathetic ophthalmia did not develop. Not so, unfortunately, for, although the total visual power may be normal, the special advantages possessed by binocular vision—to wit: the binocular field of vision and the binocular perception of depth—are taken away, the loss of the latter depriving him of his stereoscopic sense, or the power to estimate dimensions of depth directly and with precision, thus rendering him unfit for work requiring a definite and certain appreciation of distances, a power necessary in practically all of the higher crafts, and in a great many of the lower forms of occupation as well. In fact, some employers, merely on general principles, refuse to engage a one-eyed man. Although he may have normal vision in the remaining eye, the earning capacity of the individual is cut down 33% or more, even though he be so successful as to secure employment.

We cannot consider accidents resulting in blindness without taking account of the indemnity or compensation for the same. As there have been, until recently, no good compensation laws here, we shall refer to the German, although the Austrian are equally good. In the former country, the expenses of the treatment are borne from the beginning of the fourteenth week, and an income furnished the injured workman for the period of his incapacity to work. This income is 66⅔% of the yearly wage for total disability. Think, then, of the thousands of dollars wasted annually in compensation for preventable accidents, in loss of the skilled workers, in loss to the workers of their salaries, to the families of their educations, their creature comforts, if not their livelihood, the loss to the nation of the potentially prosperous citizens and taxpayers, and so on, indefinitely, around the vicious cycle. Truly Gladstone knew whereof he spoke when he remarked: "In the health of the people lies the wealth of the nation."

So much for the economic side of the question! And now let us consider the commoner causes of preventable blindness, and briefly review what is being done and what is being left

undone in the war against this "carcinoma of the country," as one medical writer has aptly styled it.

Although the work carried on in the past has shown its results in a slight decrease in the number of the blind, there are still 7500 persons yearly becoming blind in the United States, and 2000 of these are due to absolutely preventable causes, of which Ophthalmia Neonatorum heads the list.

Yes, 40% of the blindness of the world is due to this scourge! In discussing a bill providing for the care and education of the blind, recently brought into the British House of Commons, the observation was brought forth that there were in England, alone, 5000 blind persons whose misfortune was due to lack of attention at birth. A committee, appointed by the British Medical Association, has reported that one-third of the inmates in the Blind School of Great Britain have Ophthalmia Neonatorum to blame for their condition. Dumas, among 1178 blind cases, found 69% due to Ophthalmia Neonatorum. In some States the statistics are not pleasant reading, especially for us "of the cloth": in the Maryland School for the Blind the percentage from this disease has averaged 30, and in 1910 this State's percentage was 28, of which three-fourths were born under the care of midwives, and one-fourth under physicians' care. Mortifying, indeed, is the conclusion that such a percentage of preventable infantile blindness can be laid at the door of physicians. We can expect such things of the ignorant set of women who, for the most part, represent midwifery in this State, but our physicians!—the thought pains me deeply as it must every one of you. There are, in all communities, of course, some medical outcasts, men who cannot be reached, who would not, if reached, be capable of understanding the ethics of their responsibility in this matter. If I thought that there was such a man in this audience I should not speak so candidly. With you it is not worth our time to argue as to the value of this silver-nitrate prophylaxis which Créde gave us in 1881, for we are, I am sure, in accord as to its efficacy, so absolutely established by the statistics of Créde, Felsenrich, Bayer, Konigstein, and a score of others, upon thousands of comparative cases, with and without the instillations. The matter was decided, for all who follow medicine's progress, before I was born!

And with this simple means at our hands, why do babies still go blind from Ophthalmia? The answer is as clear as day: Because of the ignorance of parents, and the negligence of physicians or midwives. We can expect nothing of the parents until public instruction in the cause, effects, and prevention of Gonorrhœa has been carried directly into the households by the social workers (still a young profession but the right arm of medicine). We can expect next to nothing from the prevailing low caste of women, now practicing as midwives, until the State sees fit to impose some qualifications to demonstrate mentality or adequate experience, as is customary in a number of communities. But the Doctors of Medicine!

The work done in regard to the prevention of Ophthalmia Neonatorum is the most interesting, perhaps, of all the conservation work, and certainly merits the most attention. First, contemplating the subject from the legal standpoint:

The first legislative steps to control the disease in the United States were taken by Maine in 1891, Maryland being sixth in line with her law which, though amended not long ago, is still inadequate, as will be seen by comparison with those of New York, Pennsylvania, North Dakota, Utah, Kansas, Oregon, and others. Perhaps the most ideal law is the one which passed the Kentucky Senate a year ago. It is based upon the model bill recommended by the American Medical Association, which requires that not only midwives and physicians but nurses, hospitals, etc., must immediately report all cases in which the symptoms of Ophthalmia Neonatorum appear within thirty days after birth. This obviates the weak point in the otherwise good bills of a great many States, namely the failure to make the reporting immediate, some allowing several days' grace, in which time, we all know, the damage to sight may be irreparable from ulceration of the cornea and possible expulsion of the lens. Time will not be taken to dwell upon the laws of other countries except to say that they are, on the whole, superior to ours. The instillation of the 1% silver-nitrate solution should be enforced and failure to do so punishable by law. In New York, last year, $5000 was appropriated by the State, through legislative grant, for the free distribution, throughout

the State, of prophylactic outfits for the prevention of Ophthalmia in the newborn, consisting of sterilized dropper and bulb, vial of silver-nitrate solution, and circular containing instructions for administration. Massachusetts, New Jersey, Rhode Island, Vermont, and the District of Columbia have likewise adopted this procedure. In Indiana, North Dakota, Minnesota, New York, and Ohio, the birth certificate contains the following question: "What preventive for Ophthalmia Neonatorum did you use? If none, state the reason therefor.

Public instruction can and will accomplish a great deal. The Infirmary at Sheffield, England, distributes printed notices among the poor, via the social workers and physicians, telling of the danger of Ophthalmia, and warning them that they must consult a physician as soon as the eyes begin to matter, etc. It would be well to have the vaginal secretions of pregnant women routinely examined during the last month of pregnancy and necessary treatment instituted.

The importance of ocular hygiene in schools has, for the past few years, been generally recognized by school boards, the country over, although definite action to improve matters has, in a great many places, been deferred for various reasons. There being 20,000,000 public school children in the United States, of whom 5,000,000 suffer from eye diseases or defects, which seriously impair their school progress, if not their future worth, is it not rational that we taxpayers should insist upon the systematic examination of all school children's eyes, and correction of any existing faults obstructing their development into useful co-workers who can share our mutual burden in supporting the government appropriations? Such examination, testing of the vision of each child, employment of school nurses to look after school hygiene and instruct classes, and medical inspection of schools are now being successfully employed in a great many communities, noticeably those of New England. There are a number of places in which no child is admitted to the school until the eyes have been examined by some competent person and visual defects noted and corrected, if possible. I refer not only to the correction of ocular defects by glasses, although school children are most frequently retarded in their work by myopia, hypermetropia, astigmatism (the starting point of myopia), muscular weak-

nesses, etc., but to the conditions, not infrequently met with in the poorer, ill-nourished classes, namely: sore and red eyes, lid troubles, diseases of the lacrimal ducts, various forms of keratitis and corneal ulcerations, iritis, cataracts, and strabismus, all of which prevent good eye service, promoting, consequently, neglect of work, laziness, and truancy. As a matter of fact, separate classes for these extreme defectives should be instituted, as has already been done in New York and London, where the children, by the use of large letters, diagrams, etc., or by being read to aloud, are given the essentials, thus preserving their eyes which, otherwise, could not stand the strain of the regular curriculum, and would, upon the child's graduation, be worthless, as far as practical use is concerned. As some physicians have formed the pernicious habit of referring patients with eyestrain to the so-called "Optometrists," against the fundamental principles of visual conservation, I shall inject a word upon that subject here. Some one has well defined "Optometry" as the misguided effort, upon the part of an ignorant public, to elevate a crowd of tradespeople to the dignity of a profession. And that is just what is being done in some communities, I regret to say. These people are being entrusted with one of the most delicate and complicated special organs of the body, an end-organ of the brain, a structure sharing as intimately as the liver our systemic dyscrasias. Would you let a carpenter operate upon your mastoid simply because he handles a chisel with manual dexterity? It is about as logical for a physician who wants good results with his patient to refer a refraction case, a young person, to an optician, as it is for an opthalmologist to refer a case of syphilis to a druggist for examination and medical treatment. It is impossible, in young or middle-aged subjects, to measure correctly the refractive state of an eye in which an active ciliary body and crystalline lens, ever changing the focus, are present, and paralysis of the ciliary body must be induced.

School hygiene, however, goes farther, and demands that the schools have a good, open location, plenty of light (not intense, but coming from the left side of the schoolroom), that the ventilation be perfect, that the desks and seats be adjustable and fitted to each particular child, thereby obviating faulty postures with consequent distorted spines, tilted

heads, etc. Since the introduction of these measures in the schools of our large cities there has been a steady fall in the percentage of myopic eyes, despite the swelling of the statistics by the prevalence of myopia in our foreign-born, Russians, Jews, Poles, and the like, who come direct from sweat-shops, badly illuminated and ill-ventilated rooms, with insufficient food and outrageous hygienic surroundings.

Accidents, industrial and otherwise, are accountable for some of our most pathetic cases of blindness, for they usually occur in those upon whom others are dependent, and who can least afford to be deprived of vision. Magnus gives the proportion of traumatic cases as 10% of all blindness, although it is being rapidly cut down by the introduction of protective devices for those employed in foundries, factories, and shops where particles of steel, iron, copper, etc., fly about. The large corporations, railroads, and similar industrial organizations, realizing the economic side of the question, are making a study of this feature, and workmen are urged to wear protecting glasses, dangerous machinery is being screened, and those with weak, diseased, or only one eye are not permitted to work where there is any undue exposure of the eyes, as by flying particles, etc. The introduction of antiseptic treatment for eye wounds, the training of the employes in the removal of foreign bodies from the lids or eyes, not by finger-nails, toothpicks, knife-blades, tongues, etc., but in a clean way, have been potent factors in the cutting down of this unnecessary blindness. The household and allied accidents causing blindness can be combated only by a slow process of education. The accidents from the previous insane celebration of the Fourth of July have been wonderfully decreased since the passage of ordinances by most of our large cities prohibiting the sale or ignition of fireworks within the city limits. Baltimore has such an ordinance although not, as yet, sufficiently enforced, I regret to say.

Trachoma, thank the propitious powers! has caused Maryland little concern, although it is endemic to an alarming extent in certain sections of some of our States, and among the Indians upon the reservations. Among all examined in five counties of Kentucky, it was found present in severe form in 12.5%, while 22.7% of our Indians are afflicted. At Ellis

Island, alone, 1100 cases are annually detected. We are all only too familiar with its ravages, visual damage being caused in 75% of untreated cases. This crisis has been and is being met with a firm hand by State and Federal authorities alike, the official exclusion of infected immigrants being universally approved. In Kentucky the so-called "Mountain Fund" is provided for the maintenance of traveling clinics, addresses are given, under the auspices of the State society, in court houses, before college classes, institutes, county schools, women's clubs, and church societies. Sections of medical students are taken into the mountains, for short periods of time, in order that they may have a practical knowledge of Trachoma when they become physicians. In the Indian reservations men of experience with Trachoma have been placed in the field and are doing excellent work in the prevention of the spread of the disease, although hampered by lack of funds and insufficient appropriations. The chronicity of Trachoma and its tendency to relapse makes its treatment a prolonged one, and it has been suggested that, in the case of children, hospital schools be established, similar to those so successfully operated by the London Charity School Boards, for the treatment of children with the disease. In these institutions children are detained long enough to insure the complete eradication of the trachomatous process, receiving, while inmates, some training in the elementary branches of education, so that, when discharged, they are "earning increments of the commonwealth, not sightless charges upon it." With adults, those upon whom others lean for support (males being more frequently affected), the most feasible plan appears to be in-treatment for a month or more, until the acute stage has passed and the secretion disappeared. When discharged, the social workers follow up the cases, see that the home treatment is properly attended to, and that the patients do not transmit the disease to others. In New York special Trachoma clinics have been established for the treatment of children in the public schools.

Blindness from insufficiently treated syphilis is a form of which we have to take cognizance. It is impossible to gain accurate statistics as to this variety, but, judging from those we see in the clinics, in which treatment had evidently been

neglected, the proportion is tremendous. We all know how difficult it is to keep in touch with these patients, and how they drift away from us after a few days' treatment, but the sequels are so grave and there is so much involved, indirectly affecting ourselves, that we should make more of an effort to keep them in sight until the treatment is satisfactorily completed. It is well to bear in mind, in passing, that the spinal, intracranial, and intraocular sequels and complications of syphilis, resulting in blindness, in the great majority of cases, are seen in those whose treatment has not been completed, who have been allowed to abandon all treatment after a few months of mercury or an injection of salvarsan. Iritis, choroiditis, optic neuritis and atrophy, intracranial gummata, or spinal scleroses could, in most cases, be forestalled were the treatment carried through to the end. For this reason physicians are giving lists of procrastinating patients, and those who are neglecting their regular treatment, to the local social-service officers, knowing full well that they will send out indefatigable workers, and that the patients will be kept under observation and made to "toe the mark." Practically all of the large hospitals have their own social-service departments for the proper handling of these and similar cases, and the magnificent results secured at the Johns Hopkins Hospital, by the chief and her splendid corps of assistants, have been most encouraging. How gratifying it is to feel that all one's trouble spent in diagnosis and medical advice will not be wasted, and that the cases will be followed through and watched for the physician, the patients being visited in their homes, and the progress of the conditions, as well as the method of administering the medicines, noted. Thus the number of cases of neglected Interstitial Keratitis has been cut down, and many of the later ocular sequels of lues probably prevented.

A small proportion of blind cases are the result of neglect of simple eye lesions or mistaken diagnoses by poorly trained physicians, which is being met by the recent elevation of the standards in the larger medical schools, and the provision for ophthalmic wards in the general hospitals, arrangements thus being made for student instruction in practical ophthalmology.

We shall probably witness a great decline in the number of

blind cases from the imbibition or absorption of wood alcohol, as New York is setting the example and conducting a vigorous State and city campaign, with the active coöperation of the Brewers' Association, aiming to eliminate the use of the methyl alcohol, unless labeled "Poison." Now its promiscuous use in the adulteration of cheap whiskey, and for many other purposes, is well known, while the notice of ophthalmologists has long been attracted to a class of cases of blindness in those who shellac pencils, furniture, etc., in ill-ventilated quarters, for which reason employers have been urged to provide suitable, roomy shops, for their workers, assuring, thereby, plenty of fresh, circulating air. This toxic blindness, a disease of the optic nerve, can be caused by excess of whiskey, tobacco, lead, and several less known poisons. The first two we have learned to recognize early, with the use of the perimeter and ophthalmoscope, while the latter has been reduced wonderfully, as has general lead poisoning, by the preventive measures so familiar to us, and instituted in all important white lead works, namely: washing of hands before eating, sulphuric acid lemonade, etc.

We must still consider poor or improper illumination as the primary cause of a great deal of practical blindness. The relation of lighting to the conservation of vision has been scientifically investigated by the committee, and, in New York, with the hearty support of the Illuminating Engineering Society, the lighting of public places, churches, theatres, assembly rooms, offices, and the like, has been revolutionized, diffusion has been secured and glare has been eliminated, thereby forestalling the lenticular and retinal changes found to accompany the prolonged use of the eyes in direct, bright, glaring light.

There are several more minor subjects, of a kindred nature, which I might take up with you, but I feel that I have, already, imposed upon your patience and good nature, and, having presented the more vital items for your consideration, I am satisfied.

Of course, in the final analysis, the prevention of blindness will depend upon public instruction; for the people, through the medium of the social worker, will realize the dangers of mistreated gonorrhœa or syphilis; they will, then, know what

to expect of their midwives or physicians, and the latter will have to live up to what is expected of them; they will become acquainted with hygiene in its broadest sense, will shun the common roller-towel as they do the common drinking cup, and, before long, they will be visiting their physicians, not as simple-minded folk seeking advisement, but as friends, discussing their illnesses and reviewing their own cases in intelligent consultation. Two heads are better than one, and I shall ever prefer the somewhat medically educated patients, for they have proven of untold assistance to me on several occasions, in difficult diagnoses, by their extraordinary power of self-analysis. Show me the man who has never been helped by some sensible patient's inadvertent suggestion!

Be that as it may, this public instruction is the gradually building foundation upon which the future of this, or any similar propaganda must rest, and the Committee on the Conservation of Vision of the American Medical Association, during the year ended last June, accomplished the following:

1st. The furnishing of a popular eye article each week for the Press Bulletin, which, being distributed free every week to about six thousand newspapers, insures the reading of such useful articles by hundreds of thousands of readers annually.

2nd. The printing and distributing of twenty practical pamphlets, written by eminent ophthalmologists, on eye subjects, to both medical and lay readers. These are called the Conservation of Vision Pamphlets, and are sold or given away singly or in sets. They have been most successful and some of them are, already, in their third edition.

3rd. The establishment of a lecture bureau in most of the States, and the delivering of popular stereopticon lectures on the Conservation of Vision, in a manner suited to the laity. Thirty States, last month, reported successful lecture seasons, and that 339 lectures were given by 190 lecturers, in 283 cities, to audiences aggregating 69,425 people. (This is the record of the first or experimental year.)

4th. Through the mediumship of the lectures, the annual, systematic medical inspection of school children's eyes, etc., has been adopted in over two hundred cities.

A more vigorous campaign than ever has been mapped out by the committee, and hundreds of lectures in various parts

of the country have, already, been arranged for during the ensuing season.

The State societies are prepared to send lecturers, literature, or anything that the county physicians may desire in the line of public instruction, should such physicians be interested in disseminating the seeds of this good work among their people.

In conclusion, permit me to state my belief that the time must and will come when the gravity of the situation will be so universally recognized that there will be one uniform, national law relative to Ophthalmia Neonatorum, the most important single subject in the array of causes of preventable blindness which I have presented to you, and that this law will require, not only report of the disease at once, but the instillation at birth of the Créde prophylactic as already demanded in some countries. Money, consciences, reputations, as well as the patients' vision, can be conserved to us thereby.

AN OPERATION FOR PTOSIS WITH THE FORMATION OF A FOLD IN THE UPPER LID.

By Professor MACHEK, Lemberg.

(*With seven illustrations in the text.*)

Translated from the *Arch. f. Augenheilk.*, Volume LXXVI., 1914.

OUR methods of operation for congenital or acquired ptosis suffice usually in exposing the pupil by raising the upper lid without producing lagophthalmus during sleep. The function of the eye is thereby restored and the position of the head improved. The cosmetic result, however, is far from ideal. Any operation on the face is of a great importance for the individual's success. The patient should not only be able to see, but his appearance has also to be as near normal as possible. A ptosis operation must therefore fulfill the purpose of giving the desired cosmetic result.

In order that the eyes possess a natural appearance, the upper lid must show an extensive fold. It is well known that fibers pass from the elevator of the lid to the skin of the lid. On raising the lid the skin of the lid is drawn in above the convex margin of the tarsus, deep in between the eyeball and the upper margin of the orbit. A furrow ensues which is partly covered by the overhanging upper lid. This fold becomes less marked in age, on account of the atrophy of the orbital fat, and the skin sinks in, producing a depression between the eye and the upper orbital margin. The absence of this fold of skin suggests a pathologic and senile appearance. Most of our ptosis operations do not restore this fold of skin, or it is restored to an unnatural degree. Our young patients are therefore dissatisfied, and as the cases which require operation

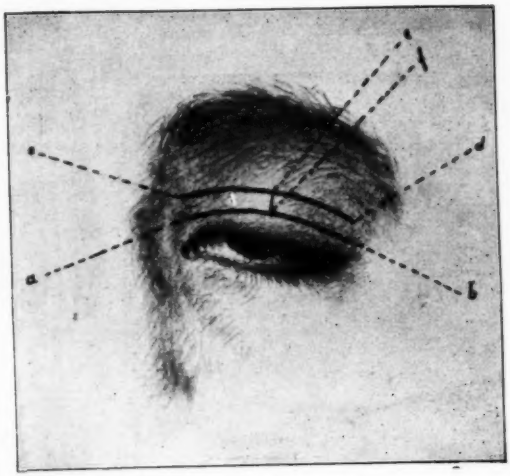


FIG. 1.

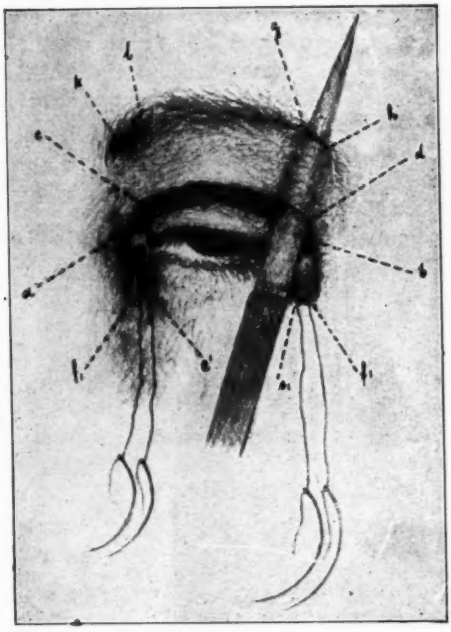


FIG. 2.

FIG. 3.

FIG. 4.

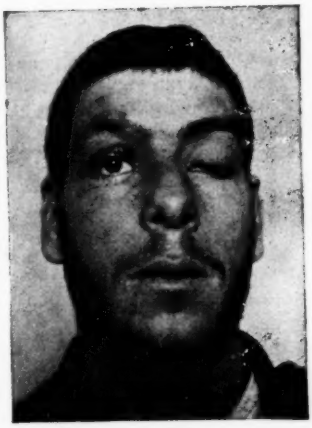


FIG. 5.

FIG. 6.

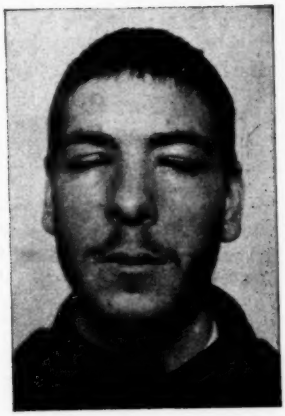


FIG. 7.

are usually congenital, this feature increases the difficulties of the operator.

In 1911, in Cracow, I suggested a procedure which answers these cosmetic demands. The lids are fixed to the eyebrows by two narrow and short flaps of skin of the lid which are passed subcutaneously on each side toward the eyebrow, thus producing a satisfactory fold in the upper lid. The idea of fixing the lid by means of a flap from the skin of the lid was originally suggested by Hunter. Panas has made use of the same idea in his operation. He formed the flap from the middle of the lid. This took away too much skin for the proper formation of a lid fold, and an unsatisfactory fold resulted. The procedure described below, following the idea of Hunter and Panas, has other attachments for raising the lid and leaves enough of the skin of the lid in order to form a large and natural fold. The flaps of skin are so thin as to cause an elastic connection. The final result is entirely satisfactory from a cosmetic standpoint.

OPERATION.

1. An incision a b is made 6*mm* above the margin of the upper lid and parallel to it from one extremity of the lid to the other.

2. The second incision, c d, passes about 5*mm* above this and parallel to a b and is at each extremity slightly longer.

3. The third incision, e f, divides the long strip of skin a b c d.

4. From e f the flaps c e f a and d e f b are dissected from the tarsus and freed, except for their attachment at a c and b d to the skin of the lid. Both flaps contract somewhat and hang down. (Fig. 2.)

5. Internally from d (Fig. 2) a doubly-cutting pointed knife is introduced underneath the skin of the lid and emerges in the eyebrow at g h. In this canal a groove director is introduced. A similar incision is made subcutaneously, emerging at k l and another director introduced.

6. A suture with two needles is then introduced in the lowest part of the skin flap from the internal surface outwards.

The needles are then passed in the directors in the direction of g h and k l. The sutures draw the flaps after them and by tying the sutures at k l and g h the flaps are fixed in their new position. They raise the lid and produce a fold which projects over the defect a c d b. The epidermis on the submerged skin flaps can be removed. It is sufficient, however, to scrape them mildly. It is not necessary to close the wound edges a b and c d with sutures.

The dressing consists in gauze covered with vaseline and a piece of rubber tissue, then a dressing.

What is the result of the operation? The lid can be raised as much as we wish and the pupil is free. The raising is obtained by the contraction of these thin elastic skin flaps, which, however, do not prevent closing of the eyes nor the reflex palpebral closure. In looking straight forward, the eye remains open on account of the rigidity of the skin flaps, without contraction of the frontalis muscle. The eye is closed by contraction of the orbicularis fibers. In our cases the normal tone of the orbicularis fibers has been sufficient to close the eye during sleep. After elevation of the lids on account of the lateral disposition of the two skin flaps, a fold results which hangs down along the entire length of the lid.

It is important that after the operation there should be a slight lagophthalmus, which will disappear in a few days. The lid will be raised according to the height at which the skin flap is fixed above the eyebrow. If the effect desired is not great, the knife can emerge below the eyebrow. As the effect does not change in the course of the after-treatment, the final effect must be obtained at the time of operation.

In the after-treatment it is important that the sutures are not removed too early, otherwise the elevation may not be sufficient. We usually leave the sutures for from between four to six days. If the bandage is left off, the sutures should be covered with adhesive plaster. The swelling and the redness does not disappear short of from four to six weeks. The operation can be employed in every form of ptosis which requires operative treatment. It is particularly to be recommended in the congenital form in young people, on account of its good cosmetic result. I am adding the histories of two cases which were operated on in 1911. In one the ptosis was

one-sided and congenital, in the other it was a congenital bilateral affection.

CASE 1.—Monolateral congenital ptosis. Patient 18 years old. The right upper lid covers the cornea. By contraction of the frontalis muscle, the lower margin of the pupil is exposed; the eye muscles are normal; vision $\frac{5}{6}$ May 17, 1911, the right upper lid was operated on by the method just described. Three days later slight lagophthalmus on attempted closure of the eyelids. The sutures were removed on the fifth day and the lids can be closed. The furrow in the lid is visible. Photograph shows the present condition. There is no difference between the two eyes, except that the lid furrow in the operated on eye is somewhat more noticeable than on the other eye.

CASE 2.—Bilateral ptosis. A. B., 20 years old, admitted December 12, 1911. Except for the deformity of the lid and a restriction in the movements of the eye upwards, the eyes are otherwise normal. December 18, 1911, the right eyelid is operated upon. The sutures are removed on the sixth day. The photograph, Figure 5, was taken on the twenty-third day after operation. The lid furrow is distinct and appears like the normal one. The left eye was subsequently operated on and eight weeks later the photograph of Figure 6 was taken. The result is a very favorable one: The closure of the lid takes place normally, as is seen in Figure 7. In closing the eyelids the fissure in the lid remains. Every experienced operator must acknowledge, after seeing these photographs, that the result is satisfactory, especially from a cosmetic standpoint. In this, I believe, the restoration of the furrow of the lid is the principal factor.

ETIOLOGY AND PATHOLOGY OF BRAWNY SCLERITIS.

By Dr. W. GILBERT, Munich.

(With one illustration in the text and Appended Plate No. XXIII.)

Translated from the *Arch. f. Augenheilk.*, Vol. LXXVI., 1914.

SINCE Schlodtmann's (1) first original publication on a peculiar disease of the sclera characterized by a gelatinous infiltration, eight cases have been examined pathologically. Our knowledge of the etiology of this condition has, however, not been advanced. The descriptions of this condition have been uniform, and Komoto describes the disease, to which he gives the name annular scleritis, as follows: It affects men in advanced life, and usually in both eyes. The disease is localized to the anterior segments of the eye, occasionally extending as far as the equator. It is characterized by an infiltration of the subconjunctival tissues and of the sclera with mononuclear cells, with large nuclei, and with but little protoplasm, with congestion of the subconjunctival blood and lymph vessels, leading to necrosis of the scleral fibers and complications with keratitis, iritis, and choroiditis. In all reports of these cases by Schlodtmann (1), Friedland (2), Uhthoff (3), Parsons (4), Procknow (5), Roosa and Oatman (6), Bietti (7), and Komoto (8), the statement is always met that tuberculosis and lues are not to be considered etiologically. Bietti is the only one who believes that tuberculosis plays a part in his case.

I wish to report upon a case belonging to this group, which throws some light upon the etiology and presents some hitherto unobserved features in the anatomic examination.

A woman, 76 years of age, with gouty nodules in nearly all finger joints as well as the middle of the foot, was taken ill in the beginning of May, 1911, with a severe inflammation of the left eye, which then led to a moderate exophthalmus and immobility. The conjunctiva protruded over the cornea like a gelatinous ridge and covered over a bulging of the sclera. The cornea was the seat of a dense vascular opacity. The swelling of the scleral conjunctiva increased continuously with severe pain, and it became necessary to remove the blind eye on June 6, 1911. The eyeball was hardened in Birsch-Hirschfeld mixture.

The right eye has remained healthy (February, 1913). Tuberculin and Wassermann reactions were negative.

The result of the pathological examination can be briefly given as follows: (A complete description will be found in the dissertation of Levin.)

The conjunctiva and episclera are swollen and protrude like a wall round the margin of the cornea, particularly below and to the outer side. The many blood-vessels show on section a pronounced perivascular infiltration, consisting principally of plasma cells (P). This plasmocytic infiltration extends with the ciliary blood-vessels through the sclera into the depths to the outer layers of the ciliary muscle. The most marked changes are to be found in the lower and the outer part. In this region the outer layers of the sclera, namely, the part over the flat portion of the ciliary body, there is an area composed of pus cells which has separated the scleral lamellæ (E 1). These cells are usually polynuclear leucocytes which have disintegrated to a great part. In addition to the cell necrosis there is a necrosis of many of the scleral fibers. Somewhat farther back in the region of the ora serrata there is another zone of infiltration in the deeper layers of the sclera, which consist principally of necrotic cells (E 2). The intervening spaces between the scleral fibres which are swollen and separated contain a finely granulated detritus, the fragments of disintegrated leucocytes, which gives the whole region a diffuse blue color after staining with hemalum (Plate XXIII n). This deep area of necrosis and infiltration in the sclera extends backwards into a purulent focus which has developed in the suprachoroidal space separating the choroid from the sclera (Plate XXIII o). This is also composed of necrotic cells and the remains of leucocytes. A little farther back the suprachoroidal space is distended with a serous exudate containing many leucocytes.

In the equatorial region the outer scleral lamellæ are closely adherent to the episcleral vascular tissue, so that the sclera seems thickened. Below there is a superficial

P
P
E1
o
E2
s
Sc
Sc

infiltration with round cells which extends to the optic disk and follows the vortex veins into the interior of the eye. The surrounding orbital tissue is firmly adherent to the sclera, and the wall of the eyeball in places is three times as thick as it normally is. (Sc.)

The choroid behind the ora serrata is thickened three or four times and shows an active round-cell infiltration with increasing leucocytes in the suprachoroidal space. This swelling and infiltration gradually subside going backward.

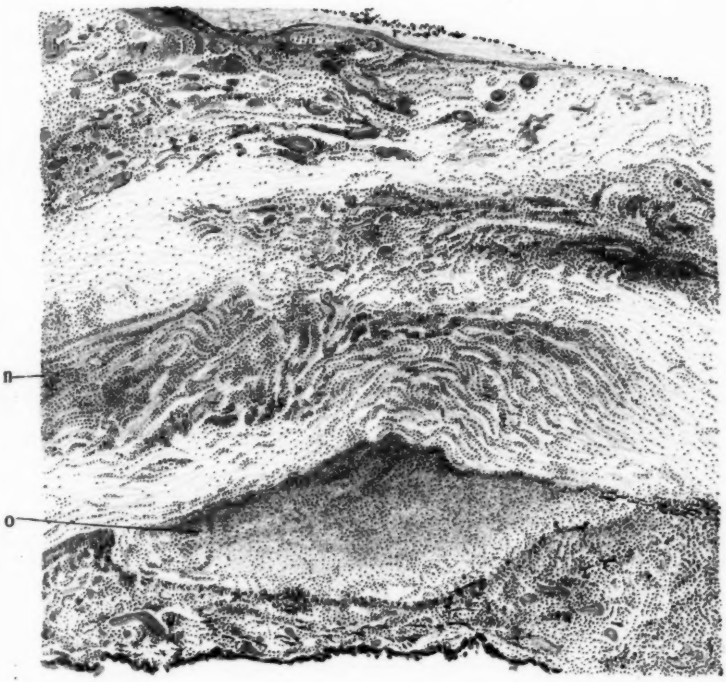
The detached retina and the optic nerve show no particular anomaly. The anatomic findings in practically all respects agree with those described in the previously published cases.

Corresponding to the more rapid clinical course, the inflammatory changes present a more acute character. Of particular interest in these cases are the tissue and the cell necroses in the sclera, as the etiologic importance of gout in our case cannot be doubted. It is well known that necrosis is a typical and a constant condition at the site of the urate deposits.

In literature on the pathology of gout formerly the views were divided, whether the tissue necrosis or the deposits of urates was a primary condition. According to Epstein (9), the necrosis of tissue following injury by the soluble neutral salts followed the deposits of urates. Rosenbach (10) showed that crystals may be formed by healthy tissue, and to-day a tissue necrosis is regarded as the injurious result of the crystals and, as Krause (11) states, necrosis without deposit of urates does not exist in gout.

Similar necroses in the sclera have been described in the cases of Schlodtmann, Friedland, Komoto, and Uhthoff and, in a case of posterior scleritis, by Wagenmann (12), without drawing attention to the etiological importance of gout. The presence of giant cells (Schlodtmann, Friedland, Uhthoff) is of particular interest, for Bennecke (13) has found giant cells in the granulation tissue of old gouty nodules. Riehl (14) saw the development of granulation tissue with large masses of giant cells about the crystal deposits, which Rosenbach regards as urophages.

This, to my mind, explains the nearly constant anatomical picture of necrosis and giant cells in this form of scleritis occurring in old individuals, where tuberculosis and lues are excluded.



H. Lodemann fec.

Gilbert, Zur Ätiologie und pathologischen Anatomie der sulzigen Skleritis.

Verlag von J. F. Bergmann, Wiesbaden. Königl. Universitätsdruckerei H. Stürtz A. G. Würzburg.

This case of gelatinous scleritis, which coincides both clinically and anatomically with those previously described, is the first one for which gout has been regarded an etiologic factor. The tissue necrosis of the sclera may be regarded as the result of the uric acid deposits, though the uric acid crystals could not be demonstrated on account of the preservation of the eyeball and its being kept in watery fluids. The conditions in the eye are, however, not so simple. Wessely (15) has shown how slight a reaction follows the injection of small amounts of mononitrium urate into the anterior chamber of the rabbit. I have injected small quantities of this sort into the superficial scleral lamellæ of the rabbit and have succeeded in producing only a transient redness. The eyes were examined after from five to eight days, and a moderate cellular infiltration was the only sign to be found at the site of the deposit. This negative result in animal experimentation cannot surprise us, because the deposit of urates in gout is only the final link in a complicated disturbance of metabolism.

In the previous descriptions of these cases nothing is mentioned of gouty diseases. Very probably marked gouty symptoms were not present. It would therefore be wise in future cases where the relationship to gout is not apparent to examine the blood for uric acid in the light of modern investigation (16). It will probably then be found that gout can be regarded as a more frequent cause. According to Krückmann (17), many cases of iritis depend upon latent gout, and there are cases with a variety of indefinite symptoms affecting the muscles and the joints without the presence of attacks of gout or tophi and where the first manifestations of gout show themselves in the eye.

Furthermore the plasmocytic perivascular infiltration of the conjunctiva and episclera is noteworthy in the places of gelatinous swelling. In the other reports of these eyes the character of the infiltration in this gelatinous swelling is not described, probably because the processes were of longer duration. According to Riehl, the deposits of the urates give rise to an inflammation in the surrounding tissue and the development of the granulation tissue. And Aschoff (18) has found the disintegration of crystalline masses through penetrating granulation tissue.

The plasma cells, which are a further development of lymphocytes and other lymphoid early stages in inflammatory processes [Pappenheim (19), Schaffer (20)], take part in the elimination and the intracellular digestion of waste products. The enormous collection of plasma cells about the necrotic scleral foci may be regarded as a reaction to the deposits of urates and the necrosis. This view is furthermore confirmed by the findings of numerous plasma cells in experimentally produced urate deposits in rabbits.

After closure of this paper, an article by Verhoeff appeared in the *Ophthalmoscope*, 1913, on a similar theme. He found in his cases and in the specimens from Schlodtmann and Friedland's cases principally plasmocytic infiltrations. As the Wassermann reaction in his case was positive, Verhoeff believes lues to be the probable cause.

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REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By GEORGE H. BELL, M.D., Secretary.

H. H. TYSON, M.D., CHAIRMAN. APRIL 19, 1915.

Dr. J. BRUDER presented a patient upon whom he had done a **trephining for detachment of retina.**

S. B., aged 48 years. About sixteen months ago the vision of left eye became suddenly obscured and there was severe pain in the head over the frontal region. Patient came to the clinic on December 17, 1913, about two weeks after the onset.

Vision O. D. $\frac{20}{70}$ Tension O. D. 25*mm*

O. S. Hand movements O. S. 12 to 14*mm*

Details of fundus not discernible, owing to hazy media. Wassermann negative; urine negative. KI was prescribed in increasing doses, which patient took for a period of about four months, when the vitreous cleared up, and a very extensive detachment of the retina came to view, occuping the entire lower half and extending over to the temporal side. With the clearing of the media her vision improved to $\frac{20}{100}$ at the end of six months, where it remained up to the time of the trephining. On December 6, 1914, about one year after the onset, the patient was trephined over the detachment. She remained at the hospital for five weeks. Her vision improved, as noted, from time to time, and at the present she sees $\frac{20}{30}$ +

Dr. T. H. CURTIN said this was an interesting case to him, as he had reported a similar one last December. His patient now has vision $\frac{20}{40}$.

Dr. J. E. WEEKS was pleased to see this case. He had trephined a case of detachment, but did not get a good result.

The field was about the same since operation as before. The vision had improved a little. He thinks well of the trephine operation.

Dr. W. B. WEIDLER asked Dr. Weeks if he had aspirated after trephining. He thinks it is necessary to aspirate after trephining.

Dr. WEEKS said that in his case it was not necessary to aspirate, as the fluid came out at the time of the operation.

Dr. T. H. CURTIN showed a case of **dislocation of lacrimal gland of each eye** in a young man, aged 22 years. When first seen there was great swelling of the upper and lower lids of both eyes, especially marked in O. S. This condition had been getting worse for a year and a half. On March 4th he extirpated the lacrimal gland of the left eye. No recurrence of œdema since that time. Since operation on left eye, tenderness and œdema have increased in the right eye.

Dr. DUANE said that dislocation or enlargement of the lacrimal glands had something to do with nutritive disturbances. Some time ago he saw a patient with recurrent erosions of the cornea who had an enlarged lacrimal gland. After removing the gland the erosion of the cornea disappeared.

Dr. M. J. SCHOENBERG did not see why the glands were removed for the swelling. He thought it was a case of blepharochalasis.

Dr. J. H. CLAIBORNE and Dr. W. B. WEIDLER agreed also that it was a case of blepharochalasis, and not a dislocation of the glands.

In closing the discussion, Dr. CURTIN said he did not show this case as one of blepharochalasis, but as a case of dislocation. The patient had improved since the removal of one gland and he proposed to remove the other.

Dr. T. H. CURTIN showed a case of **choroiditis areolaris** in a woman forty years of age.

Family history negative; Wassermann and urine negative. Von Pirquet slightly positive. Vision with correction about normal. This special form of choroiditis was first described by Förster. In this form, the first foci develop in the yellow spot, while the subsequent ones make their appearance at a constantly increasing distance from the latter. The most

recent foci, therefore, are always those situated at the periphery. This is probably a variety of choroiditis disseminata.

Dr. J. H. CLAIBORNE thought Dr. Curtin's case was one of colloid excrescences (Drusen). The yellow dots so conspicuous in this case are known under various names, and are called by the Germans "Drusen."

Dr. J. E. WEEKS also disagreed with Dr. Curtin in the diagnosis of his case. Dr. Weeks said the masses seen there were situated on the inner surface of the lamina vitrea of the choroid, which are known as warty excrescences. At first the vision is not affected, but ultimately it becomes impaired.

Dr. J. BRUDER said that he had seen a number of cases of "Drusen," or colloid degeneration of the choroid, but he thought Dr. Curtin's case was one of retinitis punctata albescens.

Dr. H. W. WOOTTON had followed one case of degeneration of the choroid for ten years. At first vision was $\frac{4}{5}\frac{8}{0}$; ten years later it was $\frac{2}{4}\frac{8}{0}$.

Dr. J. E. WEEKS showed a case of **myxosarcoma of orbit** in a child seven years of age. When Dr. Weeks first saw the patient there was enormous swelling of the lids. The tumor kept increasing, and on February 5th he performed an exenteration of the orbit. Before operation a piece of the tumor had been taken out and a diagnosis made. He first produced a granulating surface, and then lined the orbit with Thiersch grafts. The healing was uneventful. So far there have been no signs of recurrence.

Dr. HERMAN JARECKY presented a case of **bilateral anophthalmos** in two sisters.

Six weeks ago, he was asked to see a newborn female baby who had no eyes. Then to his surprise he was informed that a sister, seven years old, suffered from the same anomaly.

The family history is as follows: The parents are unrelated. The father, 35 years old, a Russian, has always been well, and has no eye trouble. His family history is negative.

The mother, 33 years old, a Russian, married fourteen years, also gives a negative family history as regards eye troubles or deformities. There is no specific or alcoholic history. The mother has had six pregnancies: first, a perfectly formed

girl, died of pneumonia when two years old; second, the seven-year-old girl, born without eyes; third, a four-and-a-half-year-old girl, perfectly formed; fourth, a stillborn boy, carried seven and a half months, perfectly formed; fifth, a miscarriage at two months; sixth, the girl baby born six weeks ago, in perfect health and well formed except the absence of both eyes. Thus the second and the sixth were the ones in which the abnormality occurred. The confinements were normal, no instruments used, and there is no history of maternal impression.

On examination, the older sister whom I present to-night is healthy and well developed in every other respect. There is no evidence of congenital syphilis. The lids are small, but well formed and furnished with lashes. The puncta can be seen, the child sheds tears when she cries, which flow down her cheeks. On separating the lids the conjunctival sac appears, but no trace of a globe can be seen or felt. When the girl turns toward the bright light, the sensation seems to affect her, and tears flow. The girl is mentally bright and intelligent.

The baby girl presents the same features of missing globes, with small well-formed lids and lashes, and has no other deformity.

In a search through the literature, I find Treacher Collins, in the *Ophthalmic Hospital Reports*, Volume XI., 1886–7, Cases VII. and VIII., and also XII., XIII., XIV., mentions the same occurrence in two sisters, the elder five years and younger four months, an intermediate child (a boy) unaffected. The other reference is of three children in a family of eight, the first, second, and fourth. The first a male, the second a female, the sex of the third not mentioned. One died at six, the second in the eighth month, and the third was living, aged fourteen. The cases of bilateral anophthalmos seem to be more common than the monophthalmic ones.

In these cases, according to Collins, as quoted above, no primary optic vesicle had budded out from the anterior primary encephalic vesicle, or having budded out it had failed to form a secondary optic vesicle.

Dr. CLAIBORNE thought all such cases should be transilluminated.

Dr. LINN EMERSON presented a case of **tear of cornea** and **sclera covered by conjunctiva.**

The patient, ten years of age, struck his eye on the arm of a chair, resulting in a tearing of the sclera and conjunctiva, with prolapse of iris and ciliary body. The vitreous projected through the gaping wound; also the lens presented at the wound.

Dr. EMERSON cut off the prolapsed iris, dissected the conjunctiva back to near the middle of globe, and then united the conjunctiva over the cornea, putting no stitches in sclera. The eye has quieted down, but there is still some wrinkling of Descemet's membrane. It looked like a case of enucleation when he first saw it.

Dr. W. B. WEIDLER presented a case of **tuberculous keratitis.**

Y. P., aged 36 years, Hungarian; female; family history negative, and personal history negative. Her present eye trouble began four years ago, and she has been under treatment, more or less, all of the time for this condition, which has gradually become worse. First came under observation at the Manhattan Eye, Ear, and Throat Hospital four months ago, at which time she states that all the doctors who had treated her said the condition was due to syphilis. Wassermann negative; Von Pirquet was positive. Patient was admitted to the hospital and given a subcutaneous injection of $\frac{1}{2}mg$ of old tuberculin, with marked local and general reaction. Vision in right eye, fingers at six inches; vision in left eye, fingers at twelve inches. After being under treatment for six or eight weeks the vision increased to: right eye, $\frac{1}{100}$; left eye, $\frac{20}{100}$. Recently the condition in the left eye has become much worse, due to fresh infiltration in the centre of the cornea in the deep stroma.

Dr. M. J. SCHOENBERG made some remarks on a case of **tuberculous iritis** which he had shown at a previous meeting.

Dr. J. H. CLAIBORNE read the report of a case of **mydriasis from the seed of the Jamestown weed.**

Two gentlemen were hunting in the fields of Eastern Virginia; the one who happened to be in front kicked a small shrub with his foot. The rear one felt something fly into his right eye, but it gave him no further concern for several

hours. Later, on board the train, he noticed an irritation of that eye, and observed that his pupil was dilated. On inspection, his wife skillfully removed from the lower lid what appeared to be two dark seeds stuck together. The following day, his pupil being no better and his sight being blurred, he came to consult me about his pupil and his vision.

As soon as he had related the facts of the case, I suspected, from my acquaintance with the flora of the region where he had been hunting, my own native heath, that he had been poisoned by the seeds of the Jamestown weed. I requested him to write to his friend in Virginia, asking him to go to the fields through which he was walking, pluck and send me, if possible, a sprig of the shrub which he had kicked. In a few days my patient brought me several leafless, dried stems of a shrub having prickly pods. I immediately recognized the specimen as the pods of the Jamestown weed, or *Datura stramonium*. The moisture and heat of the eye doubtless softened the cortex and the alkaloid produced this effect. On biting into one of the seeds, I noticed the characteristic taste of the Jamestown weed, with which I was acquainted from my boyhood. Not content with my own recognition of the plant, I took it to the College of Pharmacy, in this city, where Dr. Ballard, the botanist, likewise recognized it as *Datura stramonium*, and gave me some information concerning its habitat in this country. It grows from Nova Scotia to the Gulf, in California, Texas, and Mexico, as *Datura stramonium*, *tatula*, *fastuosa*, and *metel*, the most usual form being the one concerned in this case. The farther south it grows, the stronger the percentage of alkaloid contained. This plant belongs to the same order as the belladonna, or deadly nightshade, the Solanaceæ, all of which have the physiological effect of dilating the pupil either when directly introduced into the eye or into the general system in sufficient doses to produce its physiological effect.

I have often come in contact with this plant when I was a boy, but never knew a case of poisoning from it, and I have never heard of one proceeding from the seeds. The leaves likewise contain the active principle, and a case which was narrated to me personally by Dr. Holzclaw, of Chattanooga, Tenn., established this fact.

In 1898, when my regiment was stationed near Chattanooga, Dr. Holzclaw told me of the case of a gentleman in his private practice who awoke one morning with a widely dilated pupil and inability to see objects near by. It was his right eye. He consulted a number of physicians in the city without any satisfactory explanation, and naturally was much alarmed. He finally fell into the hands of Dr. Holzclaw, who cross-examined him concerning every act committed during the antecedent two or three days; finally, the patient admitted taking a walk the day before, which was Sunday, through the fields. Dr. Holzclaw asked if by any chance he had touched any shrub. He remembered pushing aside a bush which was in his way with his right hand, and tearing off a few leaves of it at the same time. Dr. Holzclaw requested him to go with him to the place, and on finding the identical bush, he recognized it as the Jamestown weed.

I am rather inclined to think that, if I had not known of this case, I might have missed the diagnosis in mine. A suddenly dilated pupil from no obvious reason is an alarming symptom even to the experienced in medicine. To the laity, it is naturally mysterious. It suggests to the experienced, third nerve paralysis, glaucoma, or beginning general paresis. It is important always that the cause of the dilatation be thoroughly investigated, not only for scientific accuracy, but for the peace of the mind of the individual who is affected. My patient was an educated and intelligent man who, though not greatly alarmed at the symptoms, was very much relieved mentally by the quick diagnosis. As a certain Latin author says, "Fortunate is he who can recognize the causes of things."

Dr. ALEXANDER DUANE read a paper on **Minor aids in ophthalmic work,** which appears in this number of these ARCHIVES.

REPORT OF THE TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

ANNUAL CONGRESS.

By C. DEVEREUX MARSHALL, F.R.C.S.

The Annual Congress of the Society was held on Thursday, Friday, and Saturday, April 22nd to 24th, under the presidency of Mr. F. RICHARDSON CROSS, of Bristol. The discussions were held at the Headquarters of the Royal Society of Medicine, and the clinical meeting at the Royal London Ophthalmic Hospital, City Road. There were two set discussions, and a large number of other contributions.

Mr. CHARLES WRAY (Croydon) contributed a paper on the **diagnosis and treatment of bony tumors of the orbit.** With regard to their removal, he contended that the figures of Herschfeld placed the subject in its true perspective. They showed that the mortality in cases of sinus growths—frontal, ethmoidal, and sphenoidal—were 48.2, 80, and 100% respectively; whilst the post-operative mortality was 13.6, 12.7, and 33%. The two main methods of diagnosis were by palpation, and the use of Röntgen rays. As examination by fingers was too limited, he advised the use of a thin flexible spatula 10*mm* wide and 2*mm* thick at the ends. This, pressed on the skin under the supraorbital notch, passed 15*mm* under the lid and via the fornix 33*mm*, *i. e.*, within 12 or 13*mm* of the sphencidal fissure. The measurements at the lower orbital margin were 12 and 16*mm* respectively; while at the inner and outer canthus the distance reached was 15 and 21, and 11 and 22*mm*; and as the usual distance from the margin of the orbit to the rectal spine was 45*mm* it was possible thus

to investigate half the outer wall of the orbit. In the living subject it was desirable to administer morphia an hour, and deep injections of novocaine ten minutes, before beginning the examination. As to the operation, he laid stress on the importance of dissecting up the superjacent membrane if present, and the periosteum, so as to shut off, as efficiently as possible, the field of operation from the contents of the orbit. Having tested the hardness of the growth, an attempt should be made to test the strength of the attachment to the bone, as slight leverage might snap the pedicle. If this did not occur, and the tumor was cancellous, it should be removed piecemeal, so as to discover its relation to the orbital wall. If originating from a subjacent sinus, and especially if hour-glass-shaped, the bone should be cut away so as to allow of easy removal in the safest direction. Two important landmarks were the inner canthus (over the anterior extremity of the middle turbinated) and the anterior ethmoidal foramen (giving the level of the cribriform plate). Frontal-sinus cases were the most frequent, and usually presented at the upper and inner part of the orbit. No operation should be undertaken in the presence of material alteration in the roof of the orbit as revealed by X-rays. Ivory exostoses could not be removed piecemeal. As in the cancellous variety, gentle leverage was in order, and, in the event of failure, sufficient of the orbital wall should be cut away to permit of removal in the safest direction. A clue to the size and location of the growth was obtained by radiography and the use of a strong needle.

Mr. W. D. HARMER read a paper on the **intranasal treatment of dacryocystitis.** As nasal inflammations and abnormalities rarely cause dacryocystitis, treatment of such conditions is generally disappointing. Intranasal operations on the tear sac or duct became popular in 1912, after the operations of West, Polyak, and Yankauer. A modified West operation has been preferred. Of fourteen cases treated, six have been cured, three improved, four not improved and not traced. Operations are easy to perform, and can be repeated if necessary. Dacryocystotomy is probably the best treatment for dacryocystitis.

Capt. A. W. ORMOND read a paper on **injuries to the eye in warfare.** He recounted three cases of traumatic amblyopia

following the explosion of shells. The first was of a soldier who was in the retreat from Mons. He recovered entirely after complete rest and "feeding up." A second case was associated with an error of refraction which had led to the idea that recovery had not taken place; while the third had not yet regained his former sight, though wounded more than three months ago. It was pointed out how difficult these cases are to diagnose, and how important it is to take the psychology of the men into consideration. He described the frequency of "explosion injuries" peculiar to the war, the result of hand-grenades, shrapnel, or high-velocity shells; numerous cases had occurred in which, as the result of a general explosion, small fragments of metal or dirt had been forced through the tunics of the eye; these had sometimes been overlooked, and later on, the man having complained of pain and inflammation, iritis had been correctly diagnosed, but the possibility of a foreign body being in the eye had not been realized, and sympathetic trouble might have occurred. He related two cases in which the speedy removal of the eye prevented sympathetic trouble supervening. With regard to the vexed question of removing an eye containing a foreign body, he recommended that no general dogmatic statement should be made on this debatable point, as each case must be separately considered. He deprecated relying solely on the findings of X-ray examination, because in several cases the foreign body was not discovered until a second or third radiogram had been taken, and sometimes not even then. The history, the nature of the inflammation, if any, and the amount of vision, should be taken into consideration when making a decision. Short notes were given of twenty-eight blinded soldiers, most of whom were now at St. Dunstan's, Regent's Park. Thirteen of them have no perception of light at all; and the sight of those with vision ranged from mere perception of light to ability to count fingers in one part of their field. Eighteen were the victims of bullet wounds, which, for the most part, traversed the front part of the head from side to side; four were wounded by shrapnel, one by a hand-grenade, and the others by explosion, the exact nature of which the men did not know. One, however, was due to a bullet hitting the magazine of the man's own rifle, which

exploded in his face. The author remarked on the extraordinary malignancy of these bullet wounds, several of the men when looked at appearing absolutely fit, often with both eyes intact, the scars of entrance and exit wounds being almost impossible to locate. An account was also given of a serious corneal ulceration due to the gonococcus, caused, probably, by infection from a towel which had been in general requisition. Partial recovery ensued.

Mr. CYRIL H. WALKER brought forward a paper describing **cure of spontaneous detachment of retina by multiple scleral puncture.** The patient, æt. 39, had sudden loss of sight in part of the right field in September, 1901. Two days after the occurrence there was a large detachment above, the summit of which was estimated as 12 D. He had 4.5 of myopia. He was ordered complete rest in bed for a week, and then was allowed up for an hour a day. The detachment had now swung round to the lower part of the eye, with corresponding change in the field; vision had improved. A further fortnight of partial rest showed further improvement, and he was allowed out; but the sight rapidly got worse and the detachment increased. Improvement followed more rest in bed, but it was only temporary; in December the vision had fallen to $\frac{5}{60}$. He was ordered to bed again, and five scleral punctures with a discission needle were made 10*mm* from the lower border of the cornea. The retina was pierced at each puncture, and the needle was rotated 90° after the last puncture, to let out some of the subretinal fluid under the conjunctiva. On December 21st the sight was immensely improved, and he resumed full work on March 4, 1902, with vision $\frac{6}{6}$ with glasses, and a normal field. The condition had been maintained ever since, and the only sign of detachment was the presence of a little pigment below in the choroid.

Mr. CYRIL H. WALKER also read a communication on **angiosarcoma of retina.** The patient, æt. 4 years, was seen on November 11, 1914. Eight months before there was said to have been a film over the right eye; no pain or redness. It disappeared in about six weeks. In June and September there was some pain in the eye, but the boy had regularly attended school to the end of October. The right eye was

seen to be the seat of a brownish-yellow hypopyon. There was no ophthalmoscopic reflex; the tension was normal, and the pupil dilated well with atropine. There was doubtful perception of light. The left eye was normal, and the patient's general condition good. Ten days later the eye became red and tender, and there was some continuous pain; the tension was *plus* 1. The contents of the anterior chamber were evacuated, and Professor Walker Hall reported that the material was probably sarcomatous. The eye was accordingly excised, and submitted to the same authority. Early in December some ¾ inch of the stump of the optic nerve was removed, with a mass of tissues surrounding it. Pathological examination showed that recurrence had commenced in the stump of the nerve and the surrounding tissues, but there was a small margin of healthy tissue. Dr. Osborne, of Ilfracombe, reported to him that recurrence took place within a fortnight of the second operation, and that the mass had attained the size of a cocoanut. The boy's mental condition was not affected, and there had been no metastasis. The specimen showed that the ciliary region was not invaded.

Mr. M. S. Mayou read a paper on a case of **retinitis pigmentosa treated by trephining,** the improvement following which had been maintained for four and one half months, in the hope that some light might be thrown on the ætiology of a little-understood disease. In this condition anything which improved the retinal circulation would temporarily benefit vision—such as the administration of amyl nitrate or subconjunctival injection and paracentesis of anterior chamber. Doyne had shown that extraction of the lens was followed by immense improvement in vision due, it was considered, to the fact that the patient was always in a condition of semi-daylight owing to the cataract, so that the retina did not receive sufficient stimulation. Mr. Mayou, while not denying this, thought that the lowering of the intraocular tension, with the consequent flushing of retinal vessels, and the filtration of fluid through the scar, might be an additional factor, possibly the most important one, in the good result. He, the author, thought trephining would result in the retinal vessels being flushed with blood, and that the subsequent leakage might lead to a more rapid excretion of fluid from the eye, and drain

away any toxic products which might be causing local vascular sclerosis. The patient was a female, æt. 17, who for two years had complained of night-blindness. Grandfather, father, one paternal aunt, and one brother were all affected with the same disease. The four sisters of the patient were not night-blind. She showed marked pigmentation of the periphery, the disks being slightly gray in color, and the vessels of practically normal size. The lenses were clear. When first examined, the fields were contracted to a 10° circle on both sides. On November 13th last, and again on December 1st, paracentesis of the left eye was performed, and on each occasion there was distinct improvement in the fields. On December 8th, trephining was done under general anæsthesia. On removing the disk of sclera there was a very free prolapse of iris, and it was slightly caught in the wound; recovery was otherwise uneventful. A week later the field on this side had practically reverted to normal, and she could walk about freely in a darkened room. Improvement was maintained to the present date. On covering the unoperated eye she could see well at nighttime; but if both eyes were open she was still somewhat night-blind. He could not advance any explanation of this. The improvement could not be expected to last very long; but it might continue for a length of time which justified the operation in selected cases.

Mr. F. A. JULER read notes of a case of **papilloma removed from the upper canaliculus.** The tumor came away after slitting the canaliculus, quite easily; there was no apparent pedicle. It measured 10*mm* by 4.5*mm* and in structure was a papilloma with stratified epithelium.

Dr. GEORGE MACKAY (Edinburgh) read a short note on a case of **lymphangioma of the orbit with hemorrhages,** seen first in 1906, in a child who was then 15 months old. Paracentesis, and, later, excision so far as practicable, having failed to eradicate the growth from the apex of the orbit, X-ray treatment, given by Dr. Hope Fowler, had been employed, and with much benefit. Owing to the irregularity in the patient's attendances, proptosis had been allowed to recur, at intervals of one to three years, but had always yielded to further X-ray applications. The cure now ap-

peared to be complete, and vision and movements were unimpaired.

Mr. G. COATS demonstrated a peculiarity of structure in the **choroid of the fruit-bat,** which was first observed by Lindsay Johnson. Instead of being smooth, the surface is covered with innumerable conical prominences, each containing a central vessel, which projects from the apex in the form of a long capillary loop. The outer surface of the retina has a similar serrated sectional outline. The condition is not found in any of the insectivorous bats, whose eyes in other respects also are inferior in development. It had been suggested that the structure was a device for the nourishment of the retina, in which central retinal vessels are absent in the bat. But many animals (*e. g.* the elephant and rhinoceros) which have a much thicker and more extensive retina have also no, or only rudimentary, central vessels; yet their retinæ obtain sufficient nourishment from a flat choroid without the sacrifice of form vision which the arrangement in the fruit-bat necessarily entails. According to another hypothesis, the structure is an accommodative mechanism, images of distant objects falling on the most anterior plane of the serrations; of near, the most posterior. Evidence was adduced to show that the range of accommodation so obtained could not be great, and that, inasmuch as the formation of a clear image was impossible, it could not be very useful. The most probable explanation was that the condition was a device to enable the eye to make the best possible use of low illuminations. Evidently, the serrated contour of the retina must greatly increase the superficies of the sensitive film, and augment the number of visual elements concentrated within a given area. In other respects also (its relatively large size, and the structure of the retina) the eye of the fruit-bat is characteristically adapted to a nocturnal habit.

Mr. Coats also demonstrated an encysted nematode parasite in the eyelid of the mouse. Professor A. E. Shipley, F.R.S., considered it to be *Ollulanus triespis*, the adult form of which occurs in the alimentary canal of the cat.

The author also, in conjunction with Lieut-Col. W. G. Pridmore, demonstrated a filaria from the anterior chamber of the horse, probably an immature male of *Filaria equina*.

DISCUSSION ON OPHTHALMIC INJURIES IN WARFARE.

Mr. WALTER H. H. JESSOP, in opening the discussion on this subject, dealt chiefly with the cases he had seen from the present war on land, at St. Bartholomew's and No. 1 Base hospitals. He said that the steel or cupro-nickel mantle of the bullet was often chipped, and a fragment might perforate the cornea, or embed itself in its substance. The initial high velocity of the bullet might be lost by ricocheting from a stone, and he had found that wounds so produced were more serious than direct ones. As most of the fighting was in trenches, there was a greater proportion than usual of head and face injuries, as they were the parts most exposed to the enemy. There had been a few instances of spent bullets entering the orbit and remaining there without bursting the eyeball; they were probably ricochet. Such cases often showed intraocular hemorrhages, choroido-retinal changes, and detachment of retina, generally complete. The most distressing ocular injuries, usually caused by enfilading fire, were those in which the bullet passed transversely through both orbits. There must already have been at least fifty such cases. If it was found that a wound had been made in the orbital roof, the brain substance would fill it up; and as sepsis could not be prevented, it was better to leave well alone. When the orbit and eyeball were much damaged, it was better to foment the wound and keep it as clean as possible with sodium-chloride solution, delaying removal of the eyeball until the conditions were less inflamed, always having in mind the risk of sympathetic ophthalmitis if the other eye were a good one. In the case of both eyes being destroyed, it was better to wait until the danger of sepsis was over, or it was much reduced, before removing the destroyed eyeballs, owing to the risk of meningitis He described an operation devised by Mr. W. T. Lister to avoid opening the nerve sheath. Eyelid injuries he found to be very common, and almost always accompanied by injuries of the eyeball. Usually the lids became very œdematous, hence sutures should not be inserted into them. Conjunctivitis did not seem to have been prevalent in this war. In the Franco-German war, 55% of cases of eyeball injury developed sympathetic ophthalmitis; in the American Civil war, the percentage

was 16.14. In the present war he had not seen or heard of a single case of the kind, which he attributed to the great care exercised in diagnosis and treatment, and especially the early enucleation of a ruptured globe. He had seen only one case of bullet wound implicating ocular nerves, and that case he described; it was a ricochet bullet. The bullet and shrapnel wounds of the skull vault were generally depressed, and there was a great frequency of papillœdema in such cases; the appearances were those due to pressure. Papillœdema was probably present in all cases of vault injuries, with increased intra-cranial pressure; it was not usually seen when this pressure remained normal. Fractures of the skull near the occipital lobes were often accompanied by hemianopsia. At the beginning of the war there were many cases of complete blindness following severe explosions; but sight returned at different periods up to a week. The condition in these cases was always bilateral. Some cases were deaf, in rarer instances the patient was dumb. Three of the men had extreme blepharospasm, so that they could not open their eyes for days. The initial shock in these cases was loss of consciousness, which, passing off, left loss of sight, deafness, or even loss of speech, all temporary.

Col. W. T. Lister, in a communication read by Mr. Jessop, said the outstanding features of the ophthalmic injuries in the present war were their severity and the impossibility, in most cases, of employing conservative surgery. Still, there was a great deal of work to be done. He grouped the cases into the following classes: Contusions, wounds, cases with foreign body in the eye, functional cases, and head cases. These he considered *seriatim*. In concussion cases, if the bullet did not go through the orbit the fundus showed no concussion changes. Ruptures of the choroid were fairly common, and they might be star-like or arranged in definite groups. The rest of the retina showed some pallor due to *commotio retinæ*. Penetration of the eye with small foreign bodies was a very unsatisfactory group of cases to deal with. Many of the particles did not give a sensible X-ray shadow, and even if they did, many of the fragments were non-magnetic. Two factors increased the poor outlook in operation: (1) the frequent presence of more foreign bodies than had been diagnosed; (2)

the friability of the foreign bodies, so that they broke off when caught in the forceps. It was difficult to know what to do in the case of a foreign body in the eye when the sight remained useful. He believed that even if an eye contained a foreign body, if there were no prolapse or entanglement of the uvea or lens capsule, the risk of sympathetic ophthalmitis was nil. Though the eye would probably degenerate, useful vision might persist for a considerable time. If signs of irritation did not abate, he would remove the eye. Foreign bodies in the cornea were often very troublesome to remove. When the foreign body was deeply embedded, he found a Beer's knife most useful. Mr. Lister went on to discuss, in some detail, functional cases, and quoted some striking instances. In head injuries, papillœdema occurred in slightly over 50% of the cases, but two-thirds of these had merely blurring or slight swelling. The greatest swelling occurred in association with cerebellar abscess. He did not attach much diagnostic importance to hemorrhages or exudations; and the presence of papillœdema did not point to the immediate necessity of operation; it was increasing swelling which was the significant factor. He regarded cases of occipital injury as of very great interest, as a study of them might cast important light on the cortical representation of the fundus. The facts arrived at by Dr. Gordon Holmes and himself from the examination of a number of cases, were: (1) when the lesion occurred over the occipital cortex of only one side, the result was either hemianopsia, or homonymous quadrantic defect on the opposite side; (2) when the bullet passed through both occipital lobes, there was at first complete blindness, but in several cases this gradually cleared centripetally after an interval varying from hours to days, leaving a central scotoma. He regretted his observations were not fuller, but cases were after a short time sent over to England.

The discussion was continued by Messrs. E. TREACHER COLLINS, P. H. ADAMS, G. POOLEY, CARGILL, MACKAY (Edinburgh), CRUISE, F. J. THOMAS, A. L. WHITEHEAD (Leeds), PRIESTLEY SMITH (Birmingham), TOWNSEND, COLONEL ELLIOTT, Mr. GRAY CLEGG, Professor LANDOLT, and the PRESIDENT.

THE NETTLESHIP MEDAL AND PRIZE.

At this sitting the Nettleship Medal and Prize were presented to Mr. E. TREACHER COLLINS for his valuable work in the specialty of ophthalmology.

DISCUSSION ON DETACHMENT OF THE RETINA.

A debate on this subject was introduced by Mr. M. S. MAYOU. He said that detachment of retina was only a sequel to other intraocular diseases. He dealt in the first place with its associated physical phenomena, and, secondly, with congenital detachment especially. The condition was really one of separation of the retina between the pigment-cell layer and the rods and cones, *i.e.*, where the two layers of the optic cup come together during fetal life, and which was subsequently represented as a lymph space. Detachment of retina was essentially a cystic condition. The author was strongly in agreement with von Graefe's view that it was exudative in origin, and that detachment could not occur without fluid being effused from the choroidal vessels, the fluid having a higher specific gravity than that in the vitreous chamber. It was probable that there was no true tissue adhesion between the rods and cones and pigment-cell layer, or at least so slight that it was not a factor in keeping the retina in its place. This potential space was filled with lymph, permitting the rapid tissue change associated with the bleaching and regeneration of the visual purple. In the normal eye, distention of the vitreous in its hyaloid was by fluid derived from the ciliary process; the vitreous exerted a pressure by having a higher density than the lymph in the interretinal space. In many diseases the vitreous became more fluid than normal, or the framework of the vitreous shrank with the hyaloid, and there was free fluid in the space between hyaloid and retina. With degeneration of the vitreous, the densities of the fluids on the two sides of the membrane closely approximated, and a slightly increased density of that in the interretinal space would produce detachment. For the investigation of such cases it was necessary to use a fixing agent which coagulated but did not destroy albumen,—and

boiling was the best. It was very difficult to ascertain the underlying cause of shrinkage of vitreous. Detachment of retina occurred when a larger pressure was exerted outside than inside the membrane. Detachment could occur with a normal vitreous, as when the choroid was the seat of a growth. Owing to the effusion of albuminous fluid, the retina was pushed inwards, and some of the fluid was squeezed out of the connective-tissue meshes, passing forward into the anterior chamber. Glaucoma might supervene before the complete shrinking of the vitreous. Detached retina associated with growth in the choroid was exudative in character, though it might cause secondary changes in the vitreous. He detailed some cases in children who had come under his care. In myopia, a fluid exuded into the interretinal space of low density would cause detachment, possibly associated with venous obstruction. Inflammatory exudation from the choroid might cause detachment if of serous rather than plastic nature. Injuries might cause detachment, either with or without perforation of the globe. Fibrous bands in the vitreous he thought rarely caused detachment by contraction, though they might predispose to it by causing shrinkage and fluidity of vitreous. Cysts in the retina in its normal position might be of considerable size, and by bulging cause detachment on either side. Some of the cures of detachment he thought were probably due to evacuation of the fluid contents of these cysts. Congenital detachment was not usually recognized, as it occurred in microphthalmic eyes, and was not then seen clinically. Summarized, the author's contention was that the essential feature in congenital separation between the layers of the retina was distention of the primary optic vesicle with fluid, and that the fibrosis of the vitreous was of secondary development, not the cause of failure of union between the inner and outer layer.

Mr. LESLIE PATON, in continuing the discussion of detachment of the retina, pointed out that so long as the pathology of any disease was obscure, its treatment must be empirical, and frequently ineffectual. This was the present-day attitude in regard to detachment of retina, which was really a terminal effect. In cases of tumor of choroid, detachment was caused by accumulation of œdematous fluid behind the retina, this

fluid being an irritative product. In some cases the cause was a perforating wound of the sclera, a case of which he quoted. Sometimes the detachment was due to a rapid exudation of lymph and serum into the subretinal space in severe choroiditis or general uveitis; or it might be caused by subretinal hemorrhage. He believed that detachment might occur from cicatricial contraction of the retina itself. From an examination of different types, he thought it safe to conclude that symptomatic detachment might arise from either a push from behind, a pull from inside, contraction of the retina, or a combination of any of these factors. He reminded the meeting of the main contentions of Raehlmann and Leber, and said that most cases of simple detachment occurred in myopes; he had found it to occur in all degrees of myopia, in which condition there was an increased cubical capacity of the scleral cavity. Vail, of Cincinnati, had shown that in myopes the circular ciliary muscle was usually atrophied from non-use, and that authority considered it part of a generalized atrophy of the ciliary body, with diminution of aqueous secretion and lowering of ocular tension. Mr. Paton then proceeded to discuss the question of sympathetic detachment, stating that he considered it a moot point as to whether it was really sympathetic, or whether the action was a setting up of a chronic cyclitis or uveitis in the sympathizing eye. He had had some cases of cure, *i. e.*, restoration of function, and he realized that spontaneous cure sometimes eventuated, though similar cases left alone had not got well, as had the cases in point after his treatment. In every case he thought all the facts should be placed before the patient, so that he could decide on whether he would have anything done, or not, especially as knowledge on the subject was not yet complete enough to enable a safe prognostication to be made in any particular instance.

The third opening paper was contributed by Dr. MAITLAND RAMSAY, who first reviewed the literary landmarks on the subject. He agreed with Mr. Paton that no theory of causation of detachment sufficed to account for all the cases; the underlying cause in all was disease of the uveal tract and of the pigment epithelium, though this might be nothing more than senile degeneration. The presence of a collection of

fluid between the choroid and retina led to many forms of evacuation, which the author briefly indicated—thirty-eight in number. The most important factor in the treatment he considered to be absolute rest in bed; patients often volunteered the statement that they could see best in the morning after a good night's rest, but that sight failed as the day advanced. The rest period should not be less than four to six weeks. Relapses occurred most frequently in those who had rested but a short time. Every effort should also be made to improve the patient's well-being, particular attention being bestowed on procuring a regular action of bowels, kidneys, and skin. Next, the pressure bandage was important; both eyes should be covered and the pressure must be quite appreciable, though stopping short of pain. But where the bandage caused pain, and on its removal the eye was red and irritable, it should be discontinued, owing to the possibility of iridocyclitis supervening. Cases which did not bear the pressure bandage he regarded as of unfavorable prognosis. The third important factor of treatment was subconjunctival injections after forty-eight hours of bandaging, but only if the electric ophthalmoscope showed that the site and character of the detachment appeared favorable. The pain following the injections (which he detailed) was mitigated greatly by using chemically-pure chloride of sodium. Diaphoresis he did not employ until a fortnight's trial by his other methods showed little or no improvement. In some cases diaphoresis started an improvement which became slowly progressive. He used pilocarpine for this. There should be a period of leisurely recuperation afterwards; resumption of business immediately after cure seemed to invite relapse, and this was also helped by constipation. Failure was almost certain when the choroid was extensively diseased, when the pupils were sluggish in responding to mydriatics, and when intraocular tension was greatly reduced.

The debate was continued by Sir ANDERSON CRITCHETT, Bt., and Messrs. TREACHER COLLINS, CRUISE, J. B. LAWFORD, SYDNEY STEPHENSON, LEIGHTON DAVIES, MAXWELL, STOREY (Dublin), HIGGENS, MACKAY (Edinburgh), and the PRESIDENT. The authors replied.

At the clinical meeting, held at the Royal London Ophthalmic Hospital, the following cases were shown:

Mr. J. GRAY CLEGG: Case of **bullous keratitis** whose sister was similarly affected.

Mr. SYDNEY STEPHENSON: (1) A case and drawing to illustrate coarse striate clearing of a **corneal cicatrix.**

(2) A case of **blue sclerotics.**

Mr. C. WRAY: (1) Cases operated on for **conical cornea.**

(2) Drawings of **cured conus.**

(3) **Exostosis of the orbit;** two cases.

Mr. E. TREACHER COLLINS: Case of **congenital ectropion of both lower lids.**

Mr. LESLIE PATON: Cases of **healed detachment of retina.**

Mr. HOLMES SPICER: **Congenital cataract and spontaneous dislocation of lens** in three members of the same family.

Mr. ATTLEE: **Peripapular ectasia.**

Mr. RAYNER BATTEN: **Collapsible periscope.**

Mr. W. H. H. JESSOP: **Acute central retinitis.**

Mr. POOLEY: **Extensive pigmented moles of face, eyelids, and conjunctiva.**

Mr. TREACHER COLLINS: (1) **Double facial paralysis.**

(2) **Detached retina,** cured by rest in bed, with scleral puncture.

(3) **Aphakia with apparent accommodation.**

Mr. R. FOSTER MOORE: (1) Two instances of disappearance of a **detachment of the retina in patients with albuminuria.**

(2) **Pigmented mole of rapid growth.**

Mr. CYRIL WALKER: **Hyaline bodies at the optic disk.**

Mr. HUDSON: **Iridescent corneal scar.**

The PRESIDENT (Mr. F. RICHARDSON CROSS) read a paper on **Eye symptoms in Kaposi's disease (xerodermia pigmentosum).** In a general review of the disease he stated that spots like freckles appeared in the first year or two of life, and were often precursors of the grave skin disease described by Kaposi in 1870, accompanied by dryness and atrophy of the skin, and other serious changes. Frequently it affected more than one member of a family. The prognosis was very gloomy; early death might occur from deep ulceration towards the brain or other vital parts; or from exhaustion or hemorrhage. The muco-cutaneous surfaces, such as the eyelids, became thinned, shrunken, and fissured with superficial ulcers; and the eyeball might participate in any phase

of the disease, and warts might occur on the lid edges. The ocular conjunctiva was usually hyperæmic. Some cases showed pterygium, and the cornea became hazy from infiltration of its substance or from swelling of the epithelium. Ectropion was frequently present, leading to opacity or ulcer of cornea. But in many cases the eyes were open, and light was well tolerated. The optic nerve and intraocular structures were affected only late, if at all. Massage of the eyeball, especially by the use of calomel ointment, served to empty the superficial blood-vessels. Dr. Whitfield had much improved one such case by applying X-rays. During the past year the author had had under observation two cases of Kaposi's disease, brother and sister, æt. 11 and 9½ years. The parents (cousins) were healthy. The boy was born in Ceylon, and when coming to England at nine months old he became very sunburnt in the Red Sea, his skin becoming scarlet. Later, face, neck, and shoulders were dotted with yellowish-brown pigment spots, and the skin became thin and shrunken. The girl was born in England, and arrived at Ceylon when a few months old; in her voyage she did not encounter excessive sunglare. At nine months of age her skin also became bad, and a little later a small nodule appeared on the cheek, but fell off, leaving no scar. She had implication of the eyelids, causing eversion. When four years old, the boy had a troublesome papule on the eye, for which he was treated by Sir John Tweedy, who reported that he first saw the patient in April, 1907, when he was under the care of the late Dr. Radcliffe Crocker for the skin condition. At that date there was subconjunctival ecchymosis at the outer side, and at the inner side of the globe, between the cornea and the caruncle, a truncated conical swelling with some ecchymosis and conjunctivitis. There was so much photophobia that a satisfactory view could not be obtained. On the following day, under a general anæsthetic, he examined the eye and found an indolent swelling in the conjunctiva and episclera at the inner side of the globe. He scraped it with a sharp spoon, and applied powdered salicylic acid, and ordered the eye to be washed two or three times a day with a solution of salicylate of soda. The eye gradually improved until the seat of the swelling presented the appearance of a small phlycten. Eighteen

months later, when Sir John next saw the case, the eyes were much stronger, and were rarely inflamed. Two and a quarter years later the patient saw J. 2 with correcting glasses. When Mr. Cross saw the boy twelve months ago, he had much photophobia, both winter and summer, and when in the light he was constantly sneezing. He found it difficult to read. Under chloroform, there was found to be a dull hyperæmia of the eyeballs, and two small phlyctenular swellings. The corneæ were somewhat glassy; the pupils were small, but reacted to light, and opened freely to homatropine. A few days later he saw $\frac{6}{18}$ for a moment, and J. 6. Improvement was reported after massage of the eye with calomel ointment. In November there was acute inflammation of the right eye, with a fine infiltration running across the cornea. There was also a haziness of the left cornea, with a marginal spot looking like pterygium.

Mr. R. AFFLECK GREEVES showed micro-photographs of sections through the conjunctival growth removed from the eye of a boy suffering from Kaposi's disease, mentioned by the President (Mr. Richardson Cross). The growth consisted, almost entirely, of epithelial cells, mainly prickle-cells, and showed evidence of commencing malignancy.

Mr. R. AFFLECK GREEVES read a paper on the **microscopical anatomy of syphilis of the eye,** illustrated by micro-photographs of sections taken from three cases. In the first case, one of old interstitial keratitis, he pointed to the presence of persistent though empty endothelial channels in the cornea, the remains of former blood-vessels. The second case was one of gumma of the iris, the structure of which was peculiar in that the pigment epithelium had proliferated into the inflammatory tumor, and given clinically a pigmented appearance, causing to be made the erroneous diagnosis of melano-sarcoma. The third case illustrated the pathological appearances of syphilitic scleritis and of a proliferative form of choroido-retinitis characterized by the presence of dense tissue between choroid and retina. This tissue, he considered, was probably produced by the proliferation of the retinal pigment epithelium.

Mr. GREEVES also read a paper by Mr. G. KOMOTO on the **pathological anatomy of the retina and choroid after the**

complete and partial cutting off of their respective blood supplies. It was based upon the pathological examination of an eye which was excised ten days subsequent to the cutting off of the retinal and posterior choroidal blood supplies by the removal of a lymphangioma from the posterior part of the orbit, along with a portion of the optic nerve. While the retina was completely necrotic posteriorly, all its layers were well preserved anteriorly. The author argued, from this, that the whole of the anterior part of the retina is probably almost entirely dependent on the choroidal circulation. The chromatophores of the choroid and the pigment epithelium of the retina showed peculiar changes in form, caused by their being deprived of normal blood supply. The paper was illustrated by micro-photographs.

Mr. E. TREACHER COLLINS read a communication on **apparent accommodation with aphakia.** The case was described of a boy who had lamellar cataracts removed from his eyes when seven years old by repeated discission operations. When he was fourteen, it was discovered that he was using only one pair of glasses for both distance and reading. On testing his sight it was found that he saw: right, c plus 13 $\frac{6}{6}$ths; left, c plus 13$\frac{6}{6}$ths; and with the same glasses in the same position on his nose, looking straight through the centre of them, he read J. 1 fluently. Any alteration in curvature of the cornea while he adapted his eye for the near point was excluded by examination with the ophthalmometer, and by the use of Hatten's eye-bath. Any lengthening of the antero-posterior axis of the globe was watched for by ophthalmoscopic examination. He could see just the same when the eyelids were held away from contact with the globe. When the pupils were semi-dilated with cocaine, he could still read J. 1 with plus 13 in ordinary daylight with the right; but only J. 2 with the left. When the pupils were fully dilated with atropine he could read only J. 10 with plus 13 in ordinary daylight; but in the dark room with a strong light concentrated on the test-type he still read J. 1, better with the right eye than with the left. When examined with the pupils well dilated, it was seen that in the right eye there was a membrane with a sharply defined central aperture in it, 3.5*mm* in diameter. In the left eye the aperture was larger and more oval in shape; the

membrane in it, moreover, did not occupy the entire pupillary area; a space being left at the circumference between it and the pupillary margin. Both pupils were regular, free from any adhesions, and acted very briskly to light. The author considered that the evidence he had collected in connection with this case went to show that there was not any true accommodation; that the boy's power of seeing clearly at different distances was due to the cutting off of circles of diffusion, partly by the contraction of the pupils, but mainly by the small central openings in the membranes. He quoted several other cases which had been recorded, in which apparent accommodation was present after the removal of the lens; and advocated trying to adapt the technique in operations for soft cataract so as to produce a condition similar to that in the case here described.

Mr. TREACHER COLLINS described a case in which an **epibulbar epithelioma completely disappeared after the application of radium bromide.** A man, æt. 80, had a new growth about 10*mm* in diameter at the limbus in his left eye. It had formed in two years, and was gradually increasing in size. A small piece was cut off, and microscopical examination of it showed it to be an epithelial growth, which was extending into and infiltrating the episcleral areolar tissue. At the Radium Institute the patient had 10*mg* of radium bromide on a circular disk 1*cm* in diameter, unscreened; it was held continuously over the growth for fifty minutes by a relay of assistants. After this, the growth gradually disappeared. At the end of a fortnight only a thickening at the margins was left. It was now five months since the treatment, and all that could now be seen at the site was a smooth grayish scar. The way in which epibulbar epitheliomatous growths permeate the lymphatic channels and spaces in and about the eye was then demonstrated by a series of lantern slides. It was shown how, for a long time, the sclerotic resisted such permeation and the growths remained superficial, and while this stage lasted they would be eminently amenable to treatment by radium.

Mr. J. GRAY CLEGG (Manchester) read four communications. The first was on **dystrophies of the cornea and glaucoma,** with especial reference to a familial variety of the

former. Changes in the cornea occurred which resembled those found in glaucoma, but there was no tension element. Two sisters in a family of three were shown, all affected by the disease, which probably existed in at least one other relative. Another case was related in which similar changes were present; but as there was a doubtful tension element, iridectomy had been done in one eye, and trephining in the other, without any beneficial effect on the corneæ.

The second paper was on **primary pneumococcal acute choroiditis.** The disease occurred in a healthy male, æt. 27. It affected the right eye, which had been previously examined, and found healthy. At first the appearances were considered by three oculists to be those of tubercle, consisting of two blurry yellowish-white foci at the macula. In spite of treatment, an acute panophthalmitis developed, and twenty-nine days after being first seen, a Mules operation was performed. A specimen taken at the operation showed a pure culture of the pneumococcus of Friedländer.

The third paper was on a method of **artificial maturation of cataract allowing of early extraction.** The method was, briefly, as follows. The night prior to operation the pupil was well dilated with atropine, and paracentesis was performed with an iris knife. Massage was applied directly to the lens capsule by a smooth iris repositor, and this was followed by indirect massage by the back of a lens scoop. Atropine was again instilled. If no irritation resulted, no more atropine was used after the day of operation. Often within a week the eye was perfectly quiet, the pupil returned to its ordinary size, and regained its activity. Extraction could then be resorted to, either without or with iridectomy. In this way the whole process could, in many cases, be gone through in three weeks, to recovery.

The last paper described a case of **sarcoma of the socket.** The patient had already had his left eye removed, and was wearing an artificial eye. About August, 1910, it would not keep in position, owing to the presence of a pediculated growth towards the outer part of the socket. The mass was excised, but in November, 1910, it recurred. A section of the original growth raised suspicions of malignancy, and a few days later the lid margin, with the conjunctiva and the whole contents

of the orbit, was removed. There was no recurrence. The structure, as described by Professor Walker Hall, was suggestive of perithelioma. Possibly the tumor was caused by a fine crack in the artificial eye which he had been wearing.

Mr. W. B. INGLIS POLLOCK (Glasgow) read a paper on **dissolving senile cataract** in the early stages. In a consecutive series of one hundred patients with senile cataract who were under treatment for not less than three months with alkaline lotions and dionine fibrolysin and iodolysin drops, 45% of the 178 eyes showed great improvement, and 41% an improvement in vision; 7% remained stationary. In 8% the treatment failed to arrest the progress of the cataract. The method did not cause pain, and could be persevered with over long periods. Attention should be directed to the general health, and the internal administration of an alkali was an advantage. Several patients had, he said, remained free of recurrence for a period of from three to six years.

Colonel HERBERT read a communication on the **capsular opacities of Morgagnian cataract**. He showed photo-micrographs of the capsule of a very long-standing cataractous lens, which had passed beyond the Morgagnian stage. The capsule showed scattered white dots clinically. Under the microscope these were found to consist of spaces formed between layers of thickened capsule, and containing, mainly, lens débris, similar to the "milk" of the cataractous lens. Reasons were given for supposing that similar changes may account for the globules or clear rings of after-cataract. And reference was made to two processes at work, singly or together, in senile cataract: the one, representing simply deficient nutrition, resulted eventually in an abnormally dry shrunken lens. The other, apparently due largely to destruction of the lens cells lining the capsule, consisted essentially in undue admission of aqueous into the lens, and its results.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

By H. KOELLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMELL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of Drs. ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mayence; DANIS, Brussels; GILBERT, Munich; GROENHOLM, Helsingfors; v. POPPEN, Petrograd; TREUTLER, Dresden; and VISSER, Amsterdam.

Edited by MATTHIAS LANCKTON FOSTER, M.D., F.A.C.S., New Rochelle, N. Y.

THIRD AND FOURTH QUARTERS, 1914.

(*Continued from page 479.*)

XII.—ORBITS, EXOPHTHALMOS, ACCESSORY SINUSES.

69. CECCHETTO. **Exophthalmos from gumma of the superior rectus.** *Annali di Ottalm*, f. 11–13, 1913.

70. CLEGG, J. GRAY. **A case of orbital cellulitis produced by ethmoidal sinusitis. Purulent meningitis. Death.** *Med. Chronicle*, p. 17.

71. CRAMER, E. **Bony tumors of the orbit.** *Klin. Monatsbl. f. Augenheilk.*, July–August, 1914, p. 147.

72. FUCHS. **Myxoma orbitæ.** *Zeitschr. f. Augenheilkunde*, xxxii., p. 192.

73. ROESSLER, F. **Orbital abscess with atrophy and pigmentation of the optic nerve after dacryocystitis.** *Kl. Monatsbl. f. Augenh.*, September, p. 383.

74. ZANI, D. **An unusual syndrome of syphilitic osteoperiostitis of the orbit.** *Annali di Ottalm*, f. 11–12, 1913.

CECCHETTO (69, **Exophthalmos from a gumma of the superior rectus**) reports the case of a man 35 years old, who had suffered for some days from supraorbital neuralgia and ptosis of the left eye, which very soon passed into a total ophthalmoplegia with a well-marked exophthalmos. Wasser-

mann was positive. Large doses of iodide of sodium, together with three injections of salvarsan, produced a complete recovery within two months.

CALDERARO.

ZANI (74, **Unusual syndrome of syphilitic osteoperiostitis of the orbit**) reports a case of this nature that appeared during the secondary period in a man 39 years old at the apex of his right orbit. The involvement of the ophthalmic branch of the trigeminus was shown by the anæsthesia of the corresponding region. The abducens and motoroculi also were involved, with the exception of the branch to the levator of the last. Consequently the eye was turned far inwards, was immovable, and was slightly exophthalmic. An extensive leucoma prevented an examination of the fundus. Improvement took place under specific treatment.

CALDERARO.

CLEGG (70, **Orbital cellulitis from ethmoiditis**) reports the case of a girl 19 years old who was suddenly seized with headache and vomiting. Two days later exophthalmos set in with a great œdema of the lids and impairment of vision to perception of light. The temperature and pulse remained normal. Drainage of the orbit produced a brief improvement, but death ensued on the fourth day from acute meningitis. The pus, both that from the orbit and that from the meninges, contained streptococci.

ROESSLER'S (73, **Orbital abscess after dacryocystitis**) patient had had dacryocystitis for thirty years, and had had the duct probed once, twenty-five years before. A week before coming under observation the eye became swollen and painful, and the next day was blind. When seen the lids and the region of the lacrimal sac were tensely swollen, the eyeball was injected and chemotic, exophthalmic and immovable, the pupil widely dilated and not responsive to light. The retina was cloudy, the papilla hazy, the veins tortuous and much dilated, the arteries narrow. Pus was evacuated from the orbit through incisions. The inflammatory symptoms gradually abated, leaving the papilla white, with some granular pigmentation. His explanation of the possible cause of the pigmentation may be correct or it may not.

FUCHS (72, **Myxoma orbitæ**) removed from the orbit of a

woman 40 years old, after extirpation of the lacrimal gland and section of the external rectus an encapsulated tumor one and a half times as large as the eyeball which proved under the microscope to be a myxoma. Recovery with perfect vision followed the operation.

CRAMER (71, **Bony tumors of the orbit**) found a globular piece of bone, without periosteum, in the nasal part of the orbit, laid it bare, and removed it easily with a pair of forceps. Further dissection beneath the site of the growth caused the sudden evacuation of a large quantity of a black, watery, slightly mucous fluid. Whether this was a dermoid or not could not be determined satisfactorily.

XIII.—CONJUNCTIVA.

75. BEARD, C. H. **A new operation for the removal of true and false pterygium or other growths at the sclerocorneal junction.** *Trans. American Ophthalmological Society*, 1914.

76. BEDELL, A. J. **A case of chronic sporotrichosis of the eye.** *Ibid.*

77. CECCHETTO, E. **Nontoxic antigonococcus vaccine in the treatment of gonorrheal conjunctivitis.** *Annali di Ottalm.*, f. 1–2, 1914.

78. COLOMBO, G. L. **Cystic formations and amyloid degeneration of the conjunctiva.** *La clin. oculist.*, January–February, 1914.

79. ELY, C. F. **Samoan conjunctivitis.** *Ophthalmic Record*, September, 1914.

80. HARSTON. **The treatment of trachoma by CO_2 snow.** *Ophthalmoscope*, November, 1914.

81. KOMOTO, G. **A hitherto unknown tumor of the conjunctiva.** *Klin. Monatsbl. f. Augenheilkunde*, July–August, 1914, p. 136.

82. LOEHLEIN. **Amyloid degeneration of the conjunctiva.** *Med. Verein Greifswald*, May 22, 1914.

83. PAPACCONE, E. **Trachoma corpuscles.** *Arch. di Ottalm.*, February, 1914.

84. PUSCARIU, ELENA. **Treatment of gonorrheal conjunctivitis with ethylhydrocuprein.** *Cpt. rend. hebdom. des séances de la soc. de biol.*, lxxvi., p. 831.

85. RANDOLPH, R. L. **Melanosis of the conjunctiva. Report of a case.** *Transactions American Ophthalmological Society*, 1914.

86. STREIFF, J. **Methodical examination of the circulation of the blood near the margin of the cornea.** *Klin. Monats. f. Augenh.*, September, 1914, p. 395.

87. VAIL, D. T. **A case of squirrel-plague conjunctivitis in man.** *Ophthalmic Record*, October, 1914.

STREIFF (86, **Methodical examination of the circulation of the blood near the margin of the cornea**) claims that such a

methodical study of the circulation in this situation is of clinical advantage. Any compression of the conjunctival vessels by the lids, or a prolonged concentration of light upon one spot is to be avoided carefully. If by means of a powerful lens a distinctly granular current, with occasional interruptions of the red blood column, can be seen in the conjunctival vessels, the circulation is slowed pathologically. The cause may be found in local changes in the vessels, or in general disturbances of the circulation. Such changes in the circulation in the conjunctival vessels are frequently the first manifest signs of abnormal conditions in the peripheral vascular system. If they are numerous in the neighborhood of the upper or lower margin of the cornea, their pathognomonic signification is not to be doubted. Aneurysmic dilatations are not uncommon after syphilis, but it is questionable whether they occur in ordinary senile sclerosis. Differences in caliber, miliary aneurysms, or varicose dilatations are to be seen in kidney disease, diabetes, gout, anæmia, and cachexia. The writer lays special weight on certain changes of the circulation in the limbus. In characteristic cases a great, but very uneven, distention of concentric anastomoses may be seen in the limbus capillaries, in addition to the granular current, the uneven filling of the vessels, and the differences of caliber; this indicates circulatory troubles in the eye itself, especially in the anterior portion of the choroid and in the ciliary body.

Puscariu (84, **Treatment of gonorrheal conjunctivitis with ethylhydrocuprein**) reports excellent results from the use of this preparation, otherwise known as optochin, in the treatment of eight cases of ophthalmia neonatorum. The corneal ulcers seemed to be affected favorably.

Cecchetto (77, **Nontoxic antigonococcus vaccine in the treatment of gonorrheal conjunctivitis**) reports three cases, two of infants and one of an adult, in which the subcutaneous injection of the vaccine in the lower lid produced a distinct effect upon the course of the disease, as the gonococci disappeared from the conjunctival secretion.

Calderaro.

Ely (79, **Samoan conjunctivitis**) describes a virulent endemic form of acute conjunctivitis very prevalent in Samoa, which is caused by a small Gram negative micrococcus some-

what resembling the gonococcus. It however grows well on the usual culture media. It responds readily to treatment but if neglected leads to corneal ulceration and complications.

ALLING.

A plague-like disease which was at first thought to be identical with bubonic plague was discovered among the ground squirrels of California in 1900. It was later shown to be due to a different organism. VAIL (87, **Squirrel-plague conjunctivitis**) reports a case of a butcher who developed a severe conjunctivitis with deep round ulcers and enlarged preauricular, submaxillary, and cervical glands and a dacryocystitis. Scrapings from the conjunctival ulcers were used in animal inoculations and complete bacteriological studies made. The conclusion reached was that the organism was Bacillus tularense and identical with that producing squirrel plague. It is believed that the patient entirely recovered.

ALLING.

BEDELL'S (76, **Chronic sporotrichosis of the eye**) case was a man of 49 who had had a mild purulent conjunctivitis for two years. Complete recovery took place in about two months under treatment with KI internally and the removal of five concretions from the lacrimal sac. Ocular sporotrichial infection has been noted twice before in the United States.

ALLING.

HARSTON (80, **The treatment of trachoma by CO_2 snow**) has successfully treated seven thousand cases of trachoma in China with CO_2 snow and considers that it constitutes the most rapid method of cure of trachoma, especially when employed with other recognized methods. He applies the snow pencil with firm pressure horizontally to the everted lids for fifteen seconds for the first time and at subsequent sittings for thirty seconds. Applications are made from ten to fourteen days apart. He finds no excessive scarring, and thinks that found in other clinics may be due to applications at too short intervals. Cases with much papillary overgrowth require longer to cure and in these cases there is a liability to excessive scarring, but he advocates fourteen-day intervals for applications, with firm and prolonged pressure. In some cases he has applied it as long as forty seconds. He attributes the good results to the hyperæmia produced. CURRAN.

PAPACCONE (83, **Trachoma corpuscles**) found typical trachoma corpuscles only in trachoma, and in twenty-three out of sixty cases observed. In other cases, vernal conjunctivitis, catarrhal and purulent conjunctivitis, he found inclusions which resembled these corpuscles, but could be differentiated from them. Corpuscles were rarely seen in cases that had been treated already. He agrees with Provaczek in believing them to be protozoa.

CALDERARO.

COLOMBO (78, **Cysts and amyloid degeneration of the conjunctiva**) is of the opinion that the primary cause of conjunctival cysts is an inflammatory change of the conjunctiva that produces a functional or anatomical change of the gland or of the tissue surrounding it, which gives rise to the formation of a cyst. He describes a cyst of one of Krause's glands through occlusion of its duct, and an extraordinary case of enormous amyloid degeneration of the conjunctiva taking the combined form of a tumor and of a cyst.

CALDERARO.

LOEHLEIN (82, **Amyloid degeneration of the conjunctiva**) describes a case of this nature in a patient who had no signs of trachoma. The degeneration affected only the upper lid. The epithelial covering was shown microscopically to be intact, while the adenoid tissue was densely infiltrated. The small vessels showed marked homogeneous thickenings of their walls, which completely filled the lumen of some.

KOELLNER.

KOMOTO (81, **Tumor of the conjunctiva**) removed a tumor from the transition fold of the conjunctiva and found in it masses of mulberry-like, globular, homogeneous balls, that glistened like hyalin, partly intracellular, partly extracellular, the so-called Russell's corpuscles. He therefore named it Russell's corpuscle tumor. Histologically it presented the picture of pseudotuberculosis, and it was probably caused by the irritation of a foreign body. The corpuscles were found both in the plasma cells in which they originate, and in the epithelioid cells, which come from the plasma cells. Contrary to other products of hyaline degeneration they have a marked affinity for the picric acid in van Gieson's stain.

RANDOLPH'S (85, **Melanosis of the conjunctiva**) case showed

three patches of pigment in the lower conjunctival sac. The caruncle was also deep black. In the other eye there was a small patch of pigment in the lower conjunctival sac and the caruncle was partially pigmented. The condition was apparently congenital.

ALLING.

BEARD'S (75, **Operation for pterygium**) operation differs little from well-known methods except in the fact that he cuts off only the head of the pterygium and pushes the remaining neck and base back toward the caruncle. The bared area is covered with sliding conjunctival flaps from above and below. Each of these flaps contains a portion of the upper and lower side of the pterygium which he leaves in making the first two horizontal incisions.

ALLING.

XIV.—CORNEA AND SCLERA.

88. ALESSANDRO, P. **Histological observations and histogenetical considerations concerning a case of primary epithelioma of the cornea.** *La clin. oculist.*, March–April, 1914.

89. ANTONELLI, A. **The oval cornea of hereditary syphilis.** *Revista Ital. di Ottalm.*, 1913.

90. BELL, G. H. **Report of a case of tuberculosis of the sclera of probable primary origin.** *Trans. American Ophthalmological Society*, 1914.

91. BIELSCHOWSKY. **Treatment of purulent ulcers of the cornea.** *Aerztl. Verein*, Marburg, May 24, 1914.

92. DUTOIT, A. **Observation of a case of keratitis neuroparalytica consequent upon injection of alcohol into the superior maxillary nerve for facial neuralgia.** *Zeitschrift f. Augenheilkunde*, July, p. 26.

93. GOLDSCHMIDT. **Chemotherapy of penumococcal diseases of the eye, especially of ulcus serpens with optochin ointment.** *Muenchener medizinisch Wochenschrift*, No. 27.

94. HARDY, W. F. **Parenchymatous keratitis in acquired lues.** *American Journal of Ophthalmology*, November, 1914.

95. LIBBY, G. F. **Acquired symmetrical opacities of the cornea of unusual type.** *Transactions American Ophthalmological Society*, 1914.

96. TIFFANY, F. B. **New operation for conical cornea.** *Ophth. Rec.*, August.

97. UHTHOFF, W. **A case of chronic tuberculous (?) keratitis.** *Klin. Monatsbl. f. Augenheilkunde*, July–August, 1914, p. 230.

98. UHTHOFF, W. **A case of typical ulcus corneæ rodens (Mooren) in both eyes.** *Ibid.*, p. 229.

99. ZEIGLER, S. L. **Trefoil or stellate keratectomy for anterior staphyloma.** *Journal A. M. A.*, September 5, 1914.

LIBBY (95, **Acquired symmetrical opacities of the cornea**) describes a case which had a symmetrical yellowish white opacity about 5*mm* in diameter on the nasal half of each cornea. The growth was subepithelial and the substantia propria was deeply invaded. The condition had existed about four years and no cause could be assigned. The case seems to be unique but probably belongs to the group known as family degeneration of the cornea.

ALLING.

ANTONELLI (89, **The oval cornea of hereditary syphilis**) finds that the vertical diameter of the cornea is from 1 to 1½*mm* longer than the horizontal in persons who have suffered from interstitial keratitis. The developmental anomaly is frequent with the microcornea and blue sclera associated with hereditary syphilis. He ascribes both the oval cornea and the blue sclerotic to an inhibition of development.

CALDERARO.

DUTOIT'S (92, **Neuroparalytic keratitis after injection of alcohol into the superior maxillary nerve**) patient, 40 years old, had suffered for four months from neuralgia of the superior maxillary nerve, which had involved the ophthalmic nerve for a month. Other treatment failing alcohol was injected into the nerve in the pterygomaxillary fossa. The neuralgic pain in this nerve disappeared immediately, but four days later neuroparalytic keratitis appeared, superficial loss of substance, cloudiness of the parenchyma, and absolute anæsthesia of the cornea. The ulceration healed under the influence of dionin in sixteen days, sensitiveness returned to the cornea sooner. Three weeks later alcohol was injected into the ophthalmic nerve because of the neuralgia that persisted there. This was followed quickly by an œdematous swelling of the lid which disappeared completely in a week. The neuralgia was cured. The right eye showed no pathological changes.

UHTHOFF (97, **Chronic tuberculous (?) keratitis**) reports a case in which a keratitis lasted four years and led finally to a broad, horizontal opacity in the part of the cornea lying in the palpebral fissure. The process was checked by an iridectomy. Wassermann was positive, but became negative under energetic antisyphilitic treatment. Then the other eye became affected by deep grayish infiltrates in the region of the palpe-

bral fissure, especially near the outer limbus, resembling fascicular keratitis except that the infiltrates were deeper in the cornea. Some signs of old pulmonary tuberculosis led to treatment with tuberculin, which seemed to exert a good influence. He thinks that tuberculosis was probably at the bottom of the trouble.

HARDY (94, **Parenchymatous keratitis in acquired lues**) saw the case of a boy of 17 who showed no marks of hereditary syphilis but the history of an acquired lesion. The disease ran a typical course. If the patient had hereditary lues he must have been cured of it, for only under these conditions could he have contracted syphilis.

ALLING.

BIELSCHOWSKY (91, **Treatment of purulent ulcers of the cornea**) says that while by the old methods of treatment fourteen eyes out of thirty-six suffering from serpiginous ulcer were functionally lost, the results in twenty-three treated with optochin have been excellent, seventeen recovering with a vision of more than $\frac{1}{10}$. Instillations of a 1% solution, or subconjunctival injections of a ½% solution, were employed.

KOELLNER.

According to GOLDSCHMIDT (93, **Chemotherapy of pneumococcal diseases of the eye**), optochinum hydrochloricum is a preparation that meets every indication for a chemotherapeutic remedy. The pneumococcus is particularly affected by it. The treatment must be as intensive as possible from the start, and five or six applications are necessary during the day. He prefers a 1% ointment. The eye should be cocainized before the first application. From one to three days are generally necessary for the cleansing of the ulcer. In about a hundred cases he has never seen any progression or reinfection. The treatment takes longer when the ulcers are associated with deep infiltrates. Abscess of the lacrimal sac and pneumococcal conjunctivitis are also influenced well by it.

UHTHOFF (98, **Ulcus rodens**) reports a typical case. The patient, 50 years old, had suffered from attacks of inflammation of his left eye for nine years, of his right for three. The attacks usually came on in May and lasted six weeks. The chronic ulcerative process had involved about three-fourths of

the surface of both corneæ. The boundary between the healthy and diseased parts was marked by a yellowish gray, somewhat undermined, sharp line, which advanced slowly in each successive attack. The diseased part was grayish, opaque, and very vascular, with superficial defects, but not materially ectatic. The dense, very vascular connective-tissue proliferation showed a tendency to bleed.

The microscopical examination of a tumor by ALESSANDRO (88, **Epithelioma of the cornea**) which presented all the characteristics of a primary epithelioma of the cornea showed a distinct multiplication of cells by mitosis, amitosis, atypical mitosis, fragmentation, etc., both in the epithelium and in the connective-tissue stroma, to which the increase of the neoplasm was to be ascribed exclusively. An epithelial tumor, and malignant tumors in general, may be defined as an abnormal excess of the function of reproduction of the pre-existing histological elements. The special proliferative activity of many epithelial cells furnishes us the true explanation of the pathogenesis of epithelial pearls. The necrobiosis, which presented characteristics as though tending to hyaline degeneration, explains the small size of the tumor, the frequency of hemorrhages, and the epitheliomatous ulcers.

CALDERARO.

TIFFANY (96, **New operation for conical cornea**) suggests trephining at the sclerocorneal junction and making a small peripheral iridotomy apparently under the impression that the progress of this disease is due to high intraocular pressure. He has operated upon one case.

ALLING.

ZEIGLER (99, **Trefoil or stellate keratectomy for anterior staphyloma**) advocates the removal of a portion of the staphyloma of the cornea in the form of three- or four-leaved flaps, depending on the size of the protrusion. He uses either scissors or punch to make the leaf-like excisions. He reports three cases in which the corneal curve was restored.

ALLING.

BELL'S (90, **Tuberculosis of the sclera**) case showed two or three definite nodules. Positive reaction to tuberculin both local and general proved the character of the lesion. In spite of the therapeutic administration of tuberculin the case

extended over a long period, but with final recovery. Absence of other tuberculous lesions in the body leads him to the conclusion that the process was primary.

ALLING.

XV.—IRIS AND PUPILS.

100. OLOFF. **Myotonic convergence reaction of the pupils.** *Klin. Monatsbl. f. Augenheilkunde*, October–December, p. 516.

101. SALA. **Histopathology of the ciliary ganglion. Contribution to the understanding of the Argyll-Robertson phenomenon.** *Med.-chir. Gesellsch.*, Pavia, February 6, 1914.

OLOFF (100, **Myotonic convergence reaction of the pupils**) describes two cases of this nature. There were differences between the pupils and the well-known disturbance of reaction on one side, and almost lost reaction to light. There was no disturbance of the accommodation or of the iris. Generally these cases are post-traumatic, but in these two the cause was probably central.

SALA (101, **Histopathology of the ciliary ganglion**) found in paralytics a sharply limited disease of the nerve cells whose axis-cylinders pass into the short ciliary nerves. The changes were both degenerative and regenerative, and are to be found regularly in paralytics with reflex immobility of the pupil.

XVI.—LENS.

102. FLEISCHER. **Lenticular myopia from too small and too much curved lenses with glaucoma.** *Klin. Monatsbl. f. Augenheilk.*, September, p. 433.

103. HANSELL, H. F., and SHANNON, C. E. G. **Preliminary capsulotomy in the operation for the extraction of immature cataract.** *Trans. American Ophthalmological Society*, 1914.

104. HESCHELER. **Tetany cataract.** *Med. Gesellsch. zu Kiel.*, May 11, 1914.

105. SMITH. **The treatment of the earlier stages of senile cataract.** *Ophthalmoscope*, September, 1914.

106. TOOKE, F. **The pathology of the corneal section and its complications in cataract extraction.** *Trans. Amer. Ophthalm. Society*, 1914.

107. VAIL. **Delayed healing of the wound in cataract extraction and its proper treatment.** *Ophthalmoscope*, August, 1914.

HESCHELER (104, **Tetany cataract**) found only one case of latent tetany among fifty patients with senile and presenile cataract.

TOOKE (106, **Pathology of the corneal section**) asserts that after the coagulation of fibrin between the lips of the wound the healing begins through the middle of posterior fibers of the substantia propria and that the corneal epithelium rapidly grows into the triangular space thus left along the outer side. Descemet's membrane he believes never unites. Experiments on rabbits confirm him in this opinion. Infection through a cystoid cicatrix after trephining or corneal section is due to thinning of the conjunctiva and to the fact that bacteria are known to involve the subconjunctival tissue as well as the superficial epithelium. In prolapse of the iris the anterior surface is fused with the edges of the wound and rapidly covered with epithelium. Later connective tissue flattens the iris knuckle. Lens matter and capsule tend to increase the danger of entrance of bacteria. Regarding keratitis striata, he is inclined to attribute this condition fundamentally to senile changes in the endothelium and Descemet's membrane, which permit access of aqueous after the disturbance produced by operative procedures. ALLING.

VAIL (107, **Delayed healing of the wound in cataract extraction and its proper treatment**) believes that a frequent cause of delayed healing is spasm of the orbicularis palpebrarum, and he has in three cases successfully tried severing the orbicularis from its attachment, cutting at right angles to the palpebral fissure. It produces no deformity. He recommends this operation in cases of cystoid scar beginning to form also.

CURRAN.

HANSELL and SHANNON (103, **Preliminary capsulotomy for immature cataract**) have done the Homer Smith operation seventeen times. They have, however, left an interval of twenty-four hours instead of six as recommended and have made a V-shaped incision in place of a cross. In a few cases the operation did not result in complete removal of the lens which is its only object, hence the authors are unwilling from their experience to express a definite opinion as to its value.

ALLING.

SMITH (105, **The treatment of the earlier stages of senile cataract**) divided the earlier stages of senile cataract into two classes: first, the stage we can treat without operation; and second, the stage in which operation is necessary.

In the first stage, the first symptom the patient complains of is failure for distant vision; there is no complaint on near vision. In the very earliest stages no opacity can be seen in the lens, but the fundus is seen as if under dull illumination. If in such a case the vision is reduced to $^6/_8$ or $^6/_{10}$, Smith gives twenty-five minims of one in four thousand to one in six thousand solution of cyanide of mercury, injected under the conjunctiva. In a month the patient usually comes back with $^6/_6$ vision.

In the second class of earlier cataracts, Smith argues for his intracapsule method of extraction. He has done many cases in European patients and finds no difference from those of India.

CURRAN.

FLEISCHER (102, **Lenticular myopia**) found in two members of the same family a myopia of 10 and 12 dioptres produced by the great curvature of abnormally small lenses. Two older members of the family had glaucoma, signs of which were also present in the ones first mentioned.

XVII.—VITREOUS AND CHOROID.

108. BERG. **Preretinal sarcoma of the choroid. Early perforation of the undetached retina.** *Klin. Monatsbl. f. Augenheilkunde*, July–August, p. 115.

109. BETTI. **A pathogenic variety of proteus isolated from an atypical panophthalmitis.** *Annali di Ottalm.*, f. 11–12, 1913.

110. KOYANAGI. **The infiltration of leucocytes in the choroid in leucocythæmia.** *Klin. Monatsbl. f. Augenheilkunde*, July–August, p. 152.

BETTI (109, **Pathogenic variety of proteus isolated from an atypical panophthalmitis**) reports the case of a woman 72 years old who had a panophthalmitis in one eye with destruction of the cornea and expulsion of the lens, but with little reaction on the part of the conjunctiva. A pathogenic variety of proteus was isolated from the thick pus which proved able to reproduce in animals the characteristic form of disease. On account of its morphological character, the manifestations of its biochemical action, and the injuries it inflicted on animals, the isolated micro-organism is looked upon as a hitherto undescribed variety of the proteus vulgaris of Hauser, to which it is related. This is one of the few cases in which the

proteus has been recognized as the only and certain cause of disease in man.

CALDERARO.

BERG (108, **Preretinal sarcoma of the choroid**) describes a case in which the tumor did not detach the retina, as it usually does, but perforated it and then proliferated freely into the vitreous.

KOYANAGI (110, **Infiltration of leucocytes into the choroid in leucocythæmia**) describes three cases of leucocythæmia with changes in the eye. The first was one of myeloid leucocythæmia with marked distention of the choroidal and retinal vessels, but without material infiltration of the stroma. The second was one of lymphatic leucocythæmia in which the choroid was densely infiltrated with small lymphocytes, while large ones were prominent in the blood. The choriocapillaris and retina were left free. The third was one of lymphatic leucocythæmia in which the choroid was densely infiltrated with large lymphocytes.

XVIII.—SYMPATHETIC OPHTHALMIA.

111. GIFFORD, H. **On the treatment of sympathetic ophthalmia with atophan or novatophan.** *Ophthalmic Record*, July, 1914.

112. JAMPOLSKY. **Sympathetic ophthalmia after enucleation.** *Zeitschr. f. Augenheilkunde*, September–October, p. 233.

GIFFORD (111, **Treatment of sympathetic ophthalmia with atophan or novatophan**) has used atophan as a substitute for salicylates, and was favorably impressed with its action in twenty cases of iritis, and especially in four cases of sympathetic ophthalmia.

ALLING.

JAMPOLSKY (112, **Sympathetic ophthalmia after enucleation**) reports eight cases of sympathetic ophthalmia in which the onset took place from three to thirty-eight days after enucleation. Five recovered with good vision. The interval that may elapse between the enucleation and the outbreak of the disease is uncertain.

XIX.—GLAUCOMA.

113. BUTLER, T. HARRISON. **Holth's punch operation for glaucoma.** *Ophthalmoscope*, June, 1914.

114. CALHOUN, F. P. **Hereditary glaucoma (simplex). The report**

with operative notes of three generations of one family. *Jour. A. M. A.*, July 18, 1914.

115. COLLINS, TREACHER. **The sclerocorneal trephining operation for glaucoma.** *Ophthalmoscope*, October, 1914.

116. EVANS and BUTLER. **The result of modern glaucoma operations.** *Ophthalmoscope*, August, 1914.

117. GJESSING. **Acute attack of glaucoma excited by the instillation of holocain and zinc.** *Klin. Monatsbl. f. Augenheilkunde*, September, p. 379.

118. GUGLIANETTI, L. **Sclerocorneal trephining (Elliot's operation) in the treatment of glaucoma.** *Arch. di Ottalm*, February, 1914.

119. PARKER, W. R. **Sclerocorneal trephining for glaucoma.** *Journal A. M. A.*, July 18, 1914.

120. POSEY, W. C. **The value of myotics in chronic glaucoma.** *Ibid.*, July 18th.

121. QUACKENBOSS, A. **Sclerocorneal trephining for glaucoma. Complications and failures in one hundred cases.** *Trans. Amer. Oph. Society*, 1914.

122. REBER, WENDELL. **Report on twenty-six sclerocorneal trephinings (Elliot's operation) for glaucoma.** *Ophthalmoscope*, April and May, 1914.

123. VERDERAME, F. **Sclerochoroiditis and serous cyclitis with increase of tension.** *Annali di Ottalm*, f. 11–12, 1913.

124. VOSSIUS. **Report of the cases of glaucoma operated on according to Elliot in the clinic at Giessen.** *Klin. Monatsbl. f. Augenh.*, July–August, p. 221.

125. YOUNG, GEORGE. **Decompression in glaucoma.** *Ophthalmoscope*, April.

GJESSING (117, **Glaucoma excited by holocain and zinc**) observed an attack of glaucoma after the instillation of these drugs, and is inclined to hold them responsible.

CALHOUN (114, **Hereditary glaucoma**) states that a case of glaucoma simplex in one under thirty should arouse suspicions of hereditary influence. He thinks that smallness of the cornea and globe play an unimportant part. General disease other than gout and rheumatism has little to do with causation. The liability to transmission by the two sexes seems about equal. The male sex shows a greater tendency to inheritance. Out of sixteen individuals in one family, eight had glaucoma and two doubtful conditions.

ALLING.

PARKER'S (119, **Sclerocorneal trephining for glaucoma**) statistics show that 81.58% of the 76 eyes operated upon by Col. Elliot while in this country obtained good results as far as reduction of tension was concerned. Good results were ob-

tained in 90.9% of the cases trephined after having had iridectomy done, and 50% in cases trephined after combined extraction of cataract. Of the six failures two were cases of buphthalmos in the same patient; one glaucoma secondary to uveitis after cataract extraction; another hemorrhagic glaucoma, and two chronic inflammatory glaucoma. The conclusions are that the results are better in simple non-inflammatory glaucoma than in other forms.

ALLING.

REBER'S [122, **Report on twenty-six sclerocorneal trephinings (Elliot's operation) for glaucoma**] results in the twenty-six cases of trephining in sixteen patients were satisfactory. In six eyes, the seat of absolute glaucoma, the patients were rendered free from pain and the eyeball preserved. In five eyes that were sightless, there was a small degree of vision gained. In the fifteen remaining eyes, the results were good in that the eyes gained in vision and in usefulness. Some of the lessons that were drawn from a study of the cases were: That the post-operative reaction after trephining is much longer than after iridectomy owing to the presence of lymph under the conjunctival flap; that quiet iritis is not infrequent, that if the edges of the conjunctival flap are brought down to the limbus subconjunctival filtration is interfered with; that a *2mm* trephine proved more serviceable than a *1.5mm*; and last, intraocular hemorrhage will occur in a certain percentage of cases.

TREACHER COLLINS (115, **The sclerocorneal trephining operation for glaucoma**), from a microscopic study of cases, concluded that the establishment of a permanent gap in the endothelium of Descemet's membrane is the essential feature in the operation. If this endothelium heals over there will be rise of tension. A complete disk of Descemet's membrane should be removed far enough forward not to encroach on the ligamentum pectinatum. The cornea bathed in aqueous does not tend to proliferate and thus close the trephine hole.

E. J. CURRAN.

GUGLIANETTI (118, **Sclerocorneal trephining**) comes to the following conclusions after having performed Elliot's operation on twenty-four patients. In chronic simple glaucoma the operation reduces the tension to within normal limits; the

vision improves in some cases, is not changed in others. Good results are likewise obtained in chronic inflammatory glaucoma by trephining combined with iridectomy, yet in some patients there may be noticed a little increase of tension and a simultaneous impairment of vision. The tension became normal in an advanced case, yet the vision continued to deteriorate. Trephining with iridectomy was successful twice in acute glaucoma. Trephining rendered enucleation unnecessary in two cases of absolute glaucoma. Two eyes with secondary glaucoma had to be enucleated some weeks after the operation on account of severe pain due to iridocyclitis. The eyeball was saved in eight cases. There were no severe inflammatory reactions on the part of the iris or ciliary body.

CALDERARO.

VOSSIUS (124, **Sclerocorneal trephining**) has performed this operation in twenty cases, mostly far advanced, always with a peripheral iridectomy. His results were not as good as those usually reported. Late infection occurred twice with total loss of the eye. Iridectomy is not displaced by trephining, its field is chronic glaucoma with contracted visual fields.

QUACKENBOSS (121, **Sclerocorneal trephining**), in reviewing cases operated upon at the Massachusetts Charitable Eye and Ear Hospital, reports loss of vitreous in three cases, severe iridocyclitis in two, and late infection in one. The cases which came to enucleation were of the hemorrhagic type. He thinks that the conjunctival suture should be used. The operation is the best adapted to the cases of simple chronic glaucoma. An iridectomy should be done if possible and late infection is a dangerous complication.

ALLING.

BUTLER'S (113, **Holth's punch operation for glaucoma**) experience with this operation has been satisfactory and he now uses it exclusively for all varieties of glaucoma—acute, subacute, and chronic. Only six of the twenty-nine cases reported were failures and four of these were due to defective technique. A complete iridectomy is advisable in all cases and the conjunctival flap should be held in place with a suture.

EVANS and BUTLER (116, **The result of modern glaucoma operations**) analyze seventy of their cases of acute and sub-

acute glaucoma and ninety-one cases of chronic glaucoma. In these the operations done were iridectomies, trephine, Herbert's wedge, Holth's punch, and small flap.

In the subacute and acute glaucomas, the scleral operations reduced the tension to normal in eighty-two per cent. and the iridectomies in eighty-eight per cent. In chronic glaucomas, iridectomies reduced tension to normal in seventy per cent., trephine in eighty-seven per cent., Herbert's wedge in eighty per cent, Holth's punch in seventy-seven per cent., and small flap in forty per cent. They attribute some of the good results in the sclerectomies to the fact that an iridectomy was added. In acute glaucoma with reasonable depth of the anterior chamber they consider iridectomy perhaps the most satisfactory operation.

CURRAN.

YOUNG'S (125, **Decompression in glaucoma**) operation is based on animal experimentation. A rabbit's eye was trephined, under a conjunctival flap, behind the anterior scleral ring, no communication between the trephine hole and the anterior chamber being established. A fixed quantity of fluorescein was injected into the anterior chamber and the corneal puncture closed. The other eye was treated in similar manner, but the trephining was omitted. In the non-trephined eye, there was no conjunctival reaction or drop in tension, the fluorescein disappearing from the anterior chamber in one hour. In the trephined eye, copious suffusion of the conjunctiva appeared rapidly, tension dropped, and traces of the fluorescein were in the anterior chamber six hours later. From this it would seem that the secretion of the ciliary body passed out through the trephine opening, the fluid in the anterior chamber remaining stagnant.

The operation itself is along similar lines. After a large flap of conjunctiva is freed to the limbus, two trephine openings are made in sclera above, 6*mm* apart, the openings being behind the anterior scleral ring and separated from the limbus by a strip of sclera. The flap is then sutured in place. In one case reported, that of absolute glaucoma, the tension fell promptly and remained so for two years. A special trephine set is advisable for the operation.

POSEY'S (120, **Myotics in chronic glaucoma**) paper is largely

statistical and contains notes on eighteen cases of glaucoma treated by myotics. These are supplementary to sixty-five already published. He compares results in eyes thus treated with those obtained in a similar series where iridectomy had been performed, and claims that myotics exert a much more beneficial influence over the disease. Regarding trephining, he thinks that its claims are not yet proved. He advocates increasing doses at frequent intervals so that the pupils are kept well contracted. This treatment should be confined to cases which have never shown inflammatory signs.

ALLING.

It would appear from VERDERAME'S (123, **Sclerochoroiditis and serous cyclitis with increase of tension**) case that we may occasionally meet with an increase of tension in herpes zoster, instead of the usual subnormal tension.

XX.—RETINA.

126. DIEM. **Retinitis punctata albescens and pigmentosa.** *Klin. Monatsbl. f. Augenheilkunde*, September, 1914.

127. ELLIOT, ROBERT HENRY. **A method of examining large detachments of the retina.** *Ophthalmoscope*, June, 1914.

128. FRIEDENWALD, H. **Retinitis with massive exudate.** *Transactions of the American Ophthalmological Society*, 1914.

129. LANGDON, H. M. **A case of alternating, transient, monocular blindness ending in complete loss of vision in the left eye.** *Ibid.*

130. SCHWEITZER. **Degeneration of the retina in siderosis bulbi.** *Inaug. Diss.*, Greifswald.

DIEM'S (126, **Retinitis punctata albescens and pigmentosa**) patient had a father suffering from retinitis pigmentosa. Retinitic pigment patches and yellow white spots were found in the periphery of the left eye. In addition, yellow-white dots were sprinkled about the macula in both eyes. The writer takes the condition to be a retinal atrophy running a chronic course in which the degeneration varies in different places.

In SCHWEITZER'S (130, **Degeneration of the retina in siderosis bulbi**) first case a pigment-like degeneration of the retina, with loss of vision, hemeralopia, and siderotic discoloration of the iris, set in fourteen years after a piece of iron had been removed from the eye. In his second case degeneration of the retina and siderosis of the eye appeared fifteen years after the

removal of the foreign body. No trace of any splinter of iron that had been left behind could be detected in either case.

LANGDON'S (129, **Alternating, transient, monocular blindness**) patient was forty years old and had complained for twelve years of transient attacks of monocular blindness, the left eye being more often affected than the right. He also had recurrent attacks of vertical diplopia. He did not have hemianopsia scotoma scintillans or headaches accompanying the attacks. The ophthalmoscope showed marked sclerosis of the retinal vessels and there were signs of general arterial sclerosis. Recently an attack in the left eye did not clear away and a complete collapse of the retinal vessels was observed. These cases seem to be caused by spasm of the retinal vessels and in case of permanent blindness by circulatory block.

ALLING.

ELLIOT (127, **A method of examining large detachments of the retina**) found that with dilated pupil and a transilluminator a good view of the detachment could be obtained, and that with the aid of a Zeiss loupe the details could be studied.

GROUT.

FRIEDENWALD (128, **Retinitis with massive exudate**) reports five cases which fall into a group recently studied by Coats, entitled "forms of retinal disease with massive exudate." They are characterized by the presence in the fundus of large masses of white or yellow exudate, usually with cholesterin crystals and hemorrhages. The affection occurs in young people in good health and the eyes are eventually lost. The vessels are sometimes found variously distorted. In one of the author's cases he found syphilis, in one typhoid fever with albuminuria, high blood pressure and nephritis in two. The hemorrhagic nature of the exudation seems conceded, but there are often evidences of true inflammatory choroiditis. The original article should be consulted for details of the cases.

ALLING.

XXI.—OPTIC NERVE AND VISUAL TRACT.

131. BYERS, W. G. **Tumors of the optic nerve.** *Jour. A. M. A.*, July 4, 1914.

132. CHANCE, B. **A case of total coloboma of the optic-nerve entrances.** *Annals of Ophthalmology*, October, 1914.

133. FRANCIS, L. M. **Two cases of acute retrobulbar neuritis associated with marked acetonuria.** *Journal A. M. A.*, July 4, 1914.

134. FUCHS. **Position of the lamina cribrosa and atrophic excavation.** *Zeitschrift f. Augenheilkunde*, August, p. 192.

135. HASELBERG. **Metastatic carcinoma of the optic nerve.** *Berl. klin. Wochenschrift*, p. 1237.

136. HEINE. **Diagnostic signification of monolateral optic neuritis or atrophy.** *Ibid.*, p. 1339.

137. HEINRICHSDORFF. **Changes in the optic nerve from arteriosclerosis at the base of the skull.** *Klin. Monatsbl. f. Augenheilk.*, October–December.

138. STERN. **Shot wound of the optic thalamus, with remarks concerning tractus hemianopsia.** *Neurol. Zentralblatt*, No. 11.

139. TSCHIRKOWSKY. **Choked disk with multiple sclerosis.** *Klin. Monatsbl. f. Augenheilkunde*, October–December.

TSCHIRKOWSKY (139, **Choked disk in multiple sclerosis**) reports a case of this nature that he examined anatomically. The clinical diagnosis was tumor of the cerebrum, but the pathological examination established the identity of the affections in the visual tract with foci in other locations. The difficulties encountered by the circulation of the blood and lymph throughout the whole extent of the optic nerve were thought to be the cause of the œdema of the papilla.

FUCHS (134, **Position of the lamina cribrosa**) states that the position of the lamina cribrosa at the entrance of the optic nerve may vary. An excavation may be formed in simple atrophy, and on the other hand simple glaucoma can exist without any excavation.

In HASELBERG'S case (135, **Metastatic carcinoma of the optic nerve**) the disease began as an optic neuritis with impairment of vision in a patient with carcinoma of the breast. Later opacity formed in the retina, and the eye was enucleated on account of increase of tension.

HEINE (136, **Diagnostic significance of monolateral optic neuritis or atrophy**) found over half of forty-six cases of retrobulbar neuritis caused by multiple sclerosis. In one case the multiple sclerosis did not make itself manifest until ten years after the onset of the eye trouble. Other diseases are more likely to be the cause when the retrobulbar neuritis is bilateral.

HEINRICHSDORFF (137, **Changes in the optic nerve from arteriosclerosis at the base of the skull**) describes the findings

at an autopsy. The carotids were greatly changed by arteriosclerosis so that they compressed the optic nerves in the bony canal. During life the hemianopsia was ascribed to a cerebral cause, as pressure upon the optic nerve does not seem to affect the most peripheral bundles of fibers, but causes the central ones to atrophy.

STERN (138, **Shot wound of the optic thalamus**) describes a case of shot wound of the skull in which symptoms indicated a lesion in the neighborhood of the optic thalamus. Among the ocular symptoms were: transient paresis of the abducens, hemianopsia with a preserved central visual field, hemianopic pupillary immobility, and atrophy of the optic nerve. The pupil on the side of the hemianopsia was the larger and reacted slowly.

A careful examination failed to disclose such causes as hysteria, disease of sinuses, alcohol, tobacco, etc., and FRANCIS (133, **Acute retrobulbar neuritis associated with acetonuria**) therefore concludes that his cases were caused by toxæmia associated with acetonuria. ALLING.

BYERS (131, **Tumors of the optic nerve**) distinguishes two forms of intradural tumors. One an overgrowth of the connective-tissue elements of the nerve—the other a proliferation of local endothelial cells. They however merge into each other. The former greatly outnumber the latter in frequency. They are usually associated with intracranial tumors of the same nature. As to extradural tumors they are much less common and are mostly endotheliomas, a few being sarcomas. They are of more rapid growth and are often followed by metastases. He advances arguments for early operation. The Kroenlein operation is adapted only to small tumors, while the Knapp method (entrance through an external canthotomy) is the more generally useful. ALLING.

CHANCE (132, **Total coloboma of the optic-nerve entrances**) saw a case with a very deep funnel-shaped excavation of the optic nerve about twice the size of the normal disk. There was no defect in the choroid or retina. The apex of the cone could not be made out but appeared to be about 30 D. in depth. The border of the cavity was surrounded by a faint pigment ring. The two eyes were similarly affected. The vision was $\frac{5}{15}$. ALLING.

XXII.—ACCIDENTS, INJURIES, FOREIGN BODIES, PARASITES.

140. BALLANTYNE, ARTHUR J. **Alternating hyphæma. An unusual result of concussion of the eyeball.** *Ophthalmoscope*, June, 1914.

141. FUCHS. **Iron left behind in the eye after extraction of a fragment.** *Zeitschrift f. Augenheilkunde*, August, 1914, p. 192.

142. MANZUTTO. **Visual disturbances ascribed to a strong current of electricity.** *La clin. oculist.*, March–April, 1914.

143. SPEYER. **Wound of the vitreous by a fragment of copper.** *Klin. Monatsbl. f. Augenheilkunde*, July–August, 1914, p. 194.

144. VAN DER HOEVE. **An uncommon injury of nerves.** *Ibid.*, October–December, p. 584.

SPEYER (143, **Wound of eye with copper**) reports a case in which a piece of copper entered the vitreous. It was removed the next day with forceps. Later the cataractous lens was removed, and the final vision obtained with correction was 0.8.

VAN DER HOEVE (144, **Uncommon injury of nerves**) reports a curious case. After a stab wound in the left outer canthus there followed a total paralysis of the muscles of the right eye, the right optic nerve, and an anæsthesia of the right cornea. A roentgenogram showed a knife 8*cm* long between the outer margin of the left orbit and the right optic foramen.

MANZUTTO (142, **Visual disturbances from electricity**) reports the case of a young workman who received a current of five hundred volts. When he came to, he could not see and had the sensation of a strong dazzling, and of a burning of the lids and other parts of the right eye. On the evening of the same day the burning, lacrimation, and redness of the eyes disappeared. Vision returned to the left eye first, later to the right, in which the sensation of dazzling was succeeded by severe local pain. At the end of fifteen days vision amounted to seeing movements of the hand, although there were no perceptible changes. At the end of a month it was $\frac{8}{12}$.

CALDERARO.

FUCHS (141, **Iron left behind after extraction of a fragment**) reports two cases in which iron was left in the eye after a fragment had been extracted. The extraction took place at the end of twenty days in one case, on the day following the accident in the other.

In BALLANTYNE'S (140, **Alternating hyphæma**) patient a peculiar phenomenon was observed, namely, the disappearance

of the hyphæma on fixation of a near object and its reappearance on relaxation of accommodation. Of the various explanations offered, that of a separation of the ciliary body from its scleral attachment seems the most logical. By this separation, a free communication was established between the anterior chamber and the suprachoroidal space so that during accommodation the ciliary body and possibly the choroid were drawn away from the sclera, forming a space. Into this space the blood passed during accommodation, returning to the anterior chamber on relaxation of the ciliary muscle.

IV.—**England's Augenärzte,** 1800–1850. Geschichte der Augenheilkunde, von Dr. J. HIRSCHBERG, Professor in Berlin. Graefe-Saemisch-Hess. Handbuch d. Augenh'lk. Leipzig. Engelmann, 1915. (England's Oculists, 1800–1850. History of Ophthalmology, by Dr. J. HIRSCHBERG, Professor in Berlin.)

Soon after graduating from the Harvard Medical School in 1870, I went to the Royal London Ophthalmic Hospital at Moorfields, and for more than two years spent my time amongst the great men of that era in ophthalmology: Bowman, Critchett, Lawson, Soelberg-Wells, and many others. During that time I must have chloroformed daily for various operations as many as a dozen patients, whilst the late Edward Nettleship was my frequent companion in pathological and microscopical studies.

From those days to this the memories of that wonderfully interesting era have often come back to me; often too have I looked over the diaries which I then kept and repeatedly have I wished that someone with the needed ability would write a history of that era, so that I could add it to my own recollections of those famous days in ophthalmology, when every clinic provided some new discovery by the London oculists to supplement those which the great masters in Germany were making.

At last those long unfulfilled desires have been satisfied, and there lies before me for review a complete, accurate, detailed, and well indexed history of all that the skillful oculists of the British Empire including all of its colonies have accomplished for the study and advancement and improvement of the causation, pathology, and medical or surgical cure of the

diseases of the eye from the foundation of ophthalmology to our own days.

For, although it is true that this history states that it treats of the years 1800–1850, this fact proves, on opening the book, to be a misnomer, for a history which includes the life and career and a critique of all of the published essays of Edward Nettleship, who died but yesterday, actually includes everything of value to ophthalmology that has been published in England and its colonies down to the year 1912.

This monumental work of nearly 500 pages includes all of the advances in English ophthalmology to date, and additionally offers to the reader very valuable biographical notices and many excellent portraits of the Britons who have done so much for ophthalmology. Some of these portraits lack artistic value, and some of them show the men in their youthful years, but on the whole they add to the biographical value of the work. The reader will miss a portrait of the late Soelberg-Wells, concerning whose remarkable *Treatise on Diseases of the Eye*, probably the best one ever issued in Great Britain, all too brief mention is made. For others came before, and more recent ones have pushed it aside, but in style, and in clarity of description, Soelberg-Wells's "Treatise" will long stand historically as England's best.

Beginning, now, with a review of ophthalmic conditions in England in 1800, Professor Hirschberg proceeds to quote from the diaries of continental surgeons' visits to the chief centers of population at that time and shows how little attention was given to the eye at all. From those we advance to notices of Wardrop and Vetch, beginners in ophthalmology in 1820–30, and many now unknown writers, until we see the shining light of William Adams with his studies in Egyptian ophthalmia; Saunders who first emphasized the dangers of infantile ophthalmia, and iritis with its treatment with atropine. Twenty pages are then given to a study of discission for cataract removal, and then we reach Travers, distinguished for his advocacy of mercurials in iritis, and his remarkable book on *Diseases of the Eye*, epoch-making as it was.

Following these notes on Travers, we reach a very clever account of Sir William Lawrence with many biographical details, and full mention of his energetic study of syphilitic

diseases of the eye, and his well written book on *Diseases of the Eye* and his noteworthy personality in ophthalmic surgery.

Another man worth noting at this place is Frederick Tyrrel, who died in 1843, but left behind him memories of his "hook" and his "*Practical Work on the Diseases of the Eye.*" James Dalrymple next interests us for his attention to the pathology of the eye, to strabismus, and to malignant tumors in the eye and orbit. And to close that era of ophthalmology, previous to the great discovery of the ophthalmoscope, we mention James Dixon who survived until 1896, and who first saw with artificial illumination the retina in an aphakial eye, removed foreign bodies from the vitreous, mentioned, probably for the first time, cysts of the iris, and wrote a very clever *Guide to the Practical Study of Ophthalmology* in 1855. Here now we reach the era of enormous advances in ophthalmology illuminated in Great Britain by Sir William Bowman, George Critchett, and others of that date. To those two men alone, as many as forty pages of Hirschberg's work are given, all of their essays are mentioned and dated, and credit is given to them both for all that they accomplished. Critchett was a wonderful operator, delicate, precise, exact. His corneal sections were smooth, his iridectomies in glaucoma exquisitely neat, his suturing in advancements exact, and he was the first to chloroform for cataract extraction. Mention is also made, as I well recall, of his studies to prevent sepsis of the extraction wound by making it linear, smooth, and just large enough to remove the cataract safely, without bruising the iris. Of Sir William Bowman we learn from this book, his extreme interest in diseases of the tear-passages, his double-needle operation for detachment of the retina (many of which I saw him perform), his studies in conical cornea, and his numerous lectures and essays on the physiology and surgery of the eye.

Oddly enough of Soelberg-Wells little is said, as has already been mentioned, whilst Sir Jonathan Hutchinson is too briefly dismissed, considering his famous studies in the syphilitic diseases of the eyes, and his epoch-making observation of the specific teeth of children's interstitial keratitis.

Too little is said in the work under review of the enormous number of studies of the ophthalmoscopic images of the interior of the eye accomplished at Moorfields by this famous

band of skillful surgeons, for personally I cannot help recalling many kindnesses in instruction received in this point of view from these men of Moorfields in the beginning of my studies in ophthalmology.

However, in a work even of these dimensions, it is impossible to mention all that London did for ophthalmology, and we now are called to the studies and advances made at the many other hospitals in London after so much space has been given to those at Moorfields. Amongst the names mentioned in the next hundred pages of Dr. Hirschberg's book, we can merely annotate those of Marcus Gunn, eager in his studies of the erect ophthalmoscopic image, Hancock with his suggestion of transfixing the ciliary muscle in glaucoma, Lawrence the editor of *The Ophthalmic Review*, Carter early student of color-blindness, and John Hughlings Jackson and his studies in diseases of the eye in connection with nervous affections.

Leaving the Metropolitan oculists behind, Dr. Hirschberg now conducts us to Manchester, where Benjamin Gibson early discised soft cataract, and John Walker lectured on the eye; and from there to Glasgow, forever famous as the abode of William Mackenzie with his epoch-making *Practical Treatise on Diseases of the Eye* (1830) in which we find first mention of sympathetic ophthalmia—the scourge of those injured of an eye, and the dread of every oculist attending perforating injuries of that organ.

In his account of Birmingham, mention is made of Middlemore and of his excellent "Text-Book"; of Bristol, with an appreciative notice and a speaking likeness of Prichard; of Leeds, with some account of Pridgin Teale, who has done so much for advances in glaucoma study; and of Edinburgh, where we read of Robertson and of his studies on the condition of the pupil in health and in disease. From here, the reader is taken to Ireland, where at Dublin we read much concerning Sir William Wilde with his unique English essay, *On Malformations of the Organ of Sight*, of A. Jacobson (Jacobson's Membrane) and early mention of panophthalmitis, and of Sir Henry Swanzy, author of an excellent *Hand Book on Diseases of the Eye.* The finishing touch to Ireland consists in a visit to McKewon of Belfast, and mention of his priority in magnet operations for the extraction of foreign bodies from the vitreous.

In the last pages of Hirschberg's work I find brief yet comprehensive notice of the ophthalmic advances accomplished in the British Colonies, in the way of attempts to expurgate from Egypt that dreadful endemic ophthalmia, of the introduction and cultivation on an enormous scale of the intracapsular extraction of cataract, and of the introduction of trephining for glaucoma in the Indian dominions of the British Crown.

The reader of this review cannot, I trust, fail to comprehend that in Professor Hirschberg's work we have a truly valuable contribution to the history of ophthalmology in the British Empire, well composed, well arranged, carefully indexed, and written in a delightfully attractive style. To every oculist interested in the history of his specialty, I most highly commend this work; let those who care for it all, read it through from beginning to end, whilst to the student of ophthalmic literature or to the studious investigator of biographical and ophthalmological facts, I also commend the work for examination, by means of its copious and, so far as I can discover, exact index of names and of innumerable subjects mentioned. Finally, to the genial writer, let me offer most abundant praise and thanks, for doing for Great Britain and its advances in ophthalmology something that no English writer had ever yet been able to do for his native land.

J. A. SPALDING, Portland, Maine.

V.—**An Introduction to the Study of Color Vision.** By J. HERBERT PARSONS. London. G. P. Putnam's Sons, New York. Price, $3.75.

Mr. Parsons has presented us with a work of rare quality and great importance. It is not so much for the vast amount of information that he has gathered—although this alone would make the book valuable—as for the judicious and impartial way in which the information has been arranged and collated that the reader will be grateful to him. As Mr. Parsons says, many writers on this subject have some special theory to defend; and the matter still contains so many uncertainties that a just appraisement of the several theories is not readily to be had. It is all the better, therefore, that Mr. Parsons has no theory of his own to maintain, and it is even

an advantage that he has no investigations of his own to offer. His mind seems, indeed, to have been set wholly on the task of showing what others have accomplished, and, because of this singleness of purpose, he has succeeded in presenting a well-digested, harmonious, and happily proportioned summary of probably most of the important articles on color vision and its anomalies down to the date of writing.

The book consists of three parts. The first, giving "The Facts of Color Vision," states, first, the physical, anatomical, and psychological bases on which the perception of colors depends; then treats in succession of the hue, luminosity, and saturation of colors, of color mixtures, the adaptation of the eye, the color fields, the phenomena of recurrent vision, flicker, after-images, fatigue, the effects produced by varying the area of retinal stimulation, contrast, and a very interesting series of chapters on the comparative psychology and the evolution of color vision in animals, in the primitive races, and in the child.

Part II. treats in an adequate way of the chief facts of color-blindness, irrespective of the theories that have been framed to explain them, and Part III. describes these theories with the arguments that have been adduced for and against each. Those who have been brought up on the idea that color vision and color-blindness can be explained by one theory, or by either one of two theories at most, will be surprised to find that no less than ten hypotheses have been advanced to account for the complex conditions presented.

Mr. Parsons's book is not easy reading. This is not saying that the descriptions are not lucid and accurate, for they are. But the things described are themselves not easy of comprehension, and in not a few instances require for their full understanding some knowledge of the higher mathematics. Moreover, there is such a mass of facts presented, all closely inter-connected, that the reader, in order to grasp their significance, has to study the text with careful and minute attention. Nevertheless, we are sure, the book will make a strong appeal to those who, whether ophthalmologists, physiologists, or psychologists, are interested in the study of color vision and its anomalies, and these will not grudge even a large amount of time and thought given to its careful perusal, knowing that

they will be well repaid. To ophthalmologists, who may not care to go into the matter so deeply, the book can still be cordially recommended as a work of reference, complete, trustworthy, and up to date.

A. DUANE.